Amateur Radio

JOURNAL OF THE WIRELESS INSTITUTE
OF AUSTRALIA
VOL 57, NO 3, MARCH 1989

SPECIAL REPORT
VNG UPDATE

INTRODUCTION TO THE SUPER HETERODYNE

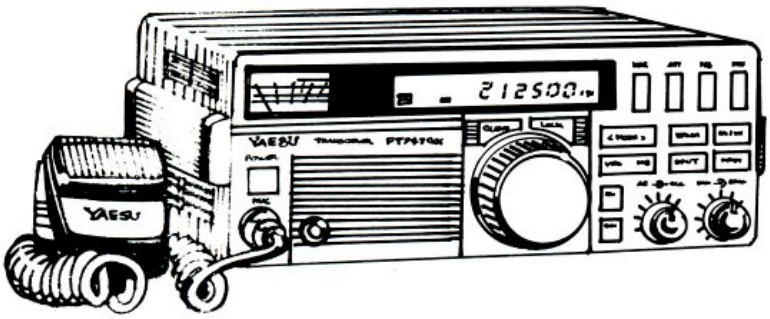
WIA PACKET POSITION

PLANS FOR WARC 1992

YAESU

Proven Price

2 YEAR WARRANTY!



Yaesu's Budget FT747GX:

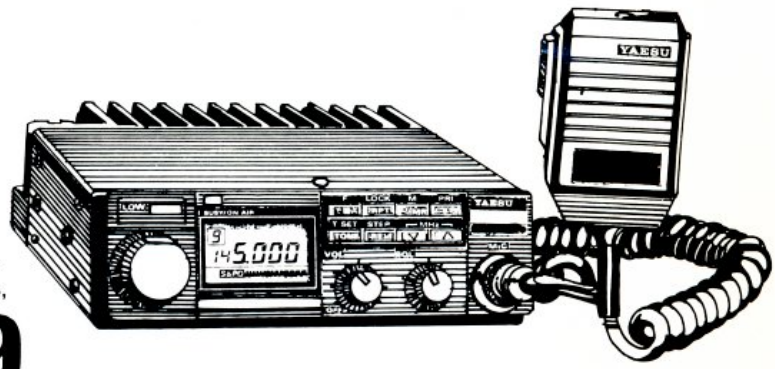
Everything you need without the frills! A full 100 watts with all amateur bands between 1.8 and 30MHz SSB, CW, AM, (optional FM); receiver is 100KHz to 29.99MHz continuous, with narrow CW and wide AM filters fitted as standard! Convenience features include dual VFOs; mode dependent tuning steps (with fast/slow selection) and 20 memories which store mode and skip-scan status. Includes bonus D- 2110 mic. Cat D-2930
See ARA review Vol II issue II.

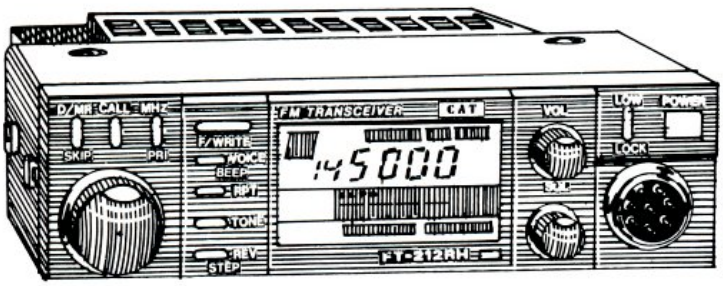
IDEAL FIRST RIG! **$1349**

SCOOP PURCHASE!

FT-2311R 23cm Transceiver

Get in quick for Australia's best value 23cm FM transceiver! Similar in design to the popular FT-211RH, it features 1240 — 1299MHz coverage, 10W output, user-settable repeater offsets, and a large backlit LCD screen. CatD-3320
Hurry stock won't last at this price! **$649**





FT-212RH

A rugged yet compact 2 metre FM transceiver featuring 45 watts output for extended range, 20 memory channels coupled with a flexible "band" and "memory" scanning system, hand-held mic, optional DVS-1 digital voice recording module, and a 2 year extended warranty. Isn't this the reliable 2 metre mobile you've been looking for? Cat D-3494

$699

FT-712RH

35W 70cm also available. Cat D-3330 **$649**

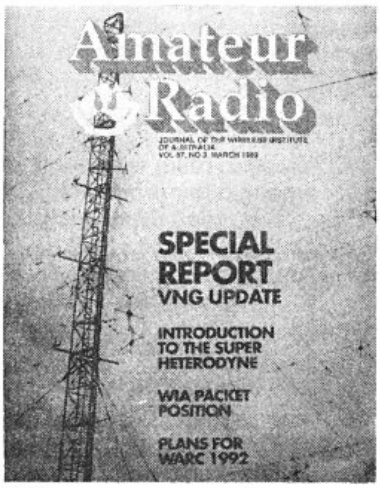
Optional DVS-1 module. Cat D-3497 **$179**

DICK SMITH ELECTRONICS

• **NSW** • **Albury** *21 8399* • **Bankstown Square** *707 4888* • **Blacktown** *671 7722* • **Bondi Junction** *387 1444* • **Campbelltown** *(046)27 2199* • **Chatswood Chase** *411 1955* • **Chullora** *642 8922* • **Gore Hill** *439 5311* • **Gosford** *25 0235* • **Hornsby** *477 6633* • **Liverpool** *600 9888* • **Maitland** *33 7866* • **Miranda** *525 2722* • **Newcastle** *61 1896* • **North Ryde** *88 3855* • **Parramatta** *689 2188* • **Penrith** *(047)32 3400* • **Railway Square** *211 3777* • **Sydney City** *267 9111* • **Tamworth** *66 1711* • **Warringah Mall** *905 0441* • **Wollongong** *28 3800* • **ACT** • **Fyshwick** *80 4944* • **VIC** • **Ballarat** *31 5433* • **Bendigo** *43 0388* • **Box Hill** *890 0699* • **Dandenong** *794 9377* • **East Brighton** *592 2366* • **Essendon** *379 7444* • **Footscray** *689 2055* • **Frankston** *783 9144* • **Geelong** *43 8804* • **Melbourne City** *326 6088* • **Richmond** *428 1614* • **Ringwood** *879 5338* • **Springvale** *547 0522* • **QLD** • **Brisbane City** *229 9377* • **Cairns** *311 515* • **Chermside** *359 6255* • **Redbank** *288 5599* • **Rockhampton** *27 9644* • **Southport** *32 9863* • **Toowoomba** *38 4300* • **Townsville** *72 5722* • **Underwood** *341 0844* • **SA** • **Adelaide City** *223 4122* • **Beverley** *347 1900* • **St. Marys** *277 8977* • **Elizabeth** *255 6099* • **Enfield** *260 6088* • **WA** • **Cannington** *451 8666* • **Fremantle** *335 9733* • **North Perth** *328 6944* • **Perth City** *481 3261* • **TAS** • **Hobart** *31 0800* • **NT** • **Stuart Park** *81 1977*

ORDER BY PHONE TOLL FREE (008) 22 6610 for DSXpress 24 HOUR DESPATCH.

Amateur Radio



Cover:

Amongst a festoon of "skywires" this tower is one of those supporting a number of Wells Quadrant aerials at the Llandilo transmitting station near Penrith NSW. The newly-reactivated standard time and frequency transmission, best known by its callsign VNG, is radiated by these aerials. See story, page 15.

Photo by Marion Leiba

Deadline for April issue is 8 March, except for Hamads which will be accepted up to 14 March.

Special Features

Technical Articles

Regular Features

Amateur Radio

Published monthly as the Official Journal by the Wireless Institute of Australia, founded 1910. ISSN 0002-6859. Registered Office: 3/105 Hawthorn Road, Caulfield North, Vic 3161. Telephone: (03) 528 5962.

EDITOR
Bill Rice VK3ABP

NEWS EDITOR
Jim Linton VK3PC

TECHNICAL EDITING CO-ORDINATOR
Peter Gibson VK3AZL

TECHNICAL EDITORS
Evan Jarman VK3ANI
Gil Sones VK3AUI

MARKETING
Bruce Kendall VK3WL

CONTRIBUTING EDITORS
Frank Beech VK7BC
Joy Collis VK2EBX
Brenda Edmonds VK3KT
Ron Fisher VK3OM
Norm Gomm VK1GN
Ken Gott VK3AJU
Gilbert Griffith VK3CQ
Roy Hartkopf VK3AOH
Robin Harwood VK7RH
Ron Henderson VK1RH
Bill Horner VK4MWZ
Eric Jamieson VK5LP
Tim Mills VK2ZTM
Hans Ruckert VK2AOU
John Sparkes VK6JX
Jennifer Warrington VK5ANW

DRAFTING
Liz Kline, Ken Kline

Inquiries and material to the Editor: PO Box 300, Caulfield South, VIC 3162

Advertising: Ann McCurdy (03) 528 5962

Material should be sent direct to PO Box 300, Caulfield South, Vic. 3162, by the second Wednesday of the month preceding publication. Check page 1 for deadline dates. HAMADS should be sent direct to the same address, by the following Tuesday.

Acknowledgement may not be made unless specifically requested. All important items should be sent by Certified Mail. The editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

TRADE PRACTICES ACT

It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly.**

VICTORIAN CONSUMER AFFAIRS ACT

All advertisers are advised that advertisements containing only a PO Box number as the address cannot be accepted without the addition of the business address of the box-holder or seller of the goods.

TYPESETTING : Redfords Media Suite 1, 5 Walworth Ave, Caulfield Nth, 3162 Tel: (03) 523 0035

PRINTING: West Web, Barwon Heads Rd, Belmont

MAIL DISTRIBUTION: Polk Mailing Co. PO Box 140, Collingwood, Vic 3066 Tel:(03) 417 5161

Opinions expressed by individuals are not necessarily those of the Wireless Institute of Australia.

EDITOR'S COMMENT

Slightly nautical

Just two years ago, in March 1987, I wrote on this page under the heading "Mainly Nautical" an account of our annual attempt on what so far has seemed a forlorn hope, namely some measure of success in the Marlay Point Overnight Sailing Race on the Gippsland Lakes. I went on to discuss the related topic of amateur radio in the maritime-mobile scene.

This time, I thought I might just briefly mention (for those one or two still in suspenseful wonderment!) what did happen in the 1987 and 1988 races, with the 1989 event now only a few weeks away, and then pass on to another topic of strong interest at least vaguely related to all this.

To cut a long story short, the 1987 race was postponed twice, about six hours each time, and then cancelled soon after sunrise. In the 19 previous years cancellation had never been necessary, but this time the weather was really bad with winds of up to 60 knots. We did actually sail across Lake Wellington anyway, along with about 100 other boats, and were hit by one strong storm-front which we survived undamaged. Some others were not so lucky, and seven were sunk but their crews were rescued unhurt.

Last year, the weather was almost a carbon copy of 1987, but after postponement again until morning the race was sailed in a strong south-westerly and some very fast times recorded. Unfortunately, within sight of the finish we were forced to retire with a split centre-board among other problems!

This year, who knows? It is very obvious though, that the boat needs more attention and the crew more practice (skipper included). Now that Amateur Radio is largely being produced at the Executive Office, rather than by contract, your Editor has even less time to go sailing, poor chap! And since I did not retire from full-time work to become almost as tied to a voluntary part-time job, we now have a vacancy for a PAID PART-TIME EDITOR!

I suppose I could forego sailing a while longer, and take on the job. But this would then preclude me from remaining on Executive, whose members are not permitted to be WIA employees. I think I have been Managing Editor long enough. Is there any suitably qualified active Melbourne radio amateur who would like to take it on?

The job involves about ten full days work each month, and the salary will be attractive and negotiable. It would best suit someone who already has another part-time job, or who has retired early. Demonstrated competence in English technical journalism is essential, preferably at tertiary level.

Who among you can take me out of the Editor's chair (except as a executive figurehead) and put me at the helm of my trailer-sailer? We are all eager to see if someone will accept the challenge!

Bill Rice VK3ABP
Editor

PUBLICATION COMMITTEE AWARDS

At its December meeting the Publications Commiteee considered all contributions published in Amateur Radio during 1988 and selected three authors whose work merited the annual awards given by the WIA.

The winners are:

1. The Al Shawsmith Journalistic Award, for the article on a radio theme considered best to display literary merit. $100 and an engraved plaque to Ken England VK4JPE for his article entitled "The Wilga Tree".

2. The Higginbotham Award for meritorious service to amateur radio generally, not necessarily only to the magazine. $100 to Lloyd Butler VK5BR for his continuing contributions on a wide range of topics.

3. The Technical Award for the best technical article/s of the year. $100 to Drew Diamond VK3XU for his "Novice Notes" series and particularly the article on VFO construction.

WIA DIRECTORY

Federal Council

Kevin Olds	VK1OK	ACT Councillor
Peter Jeremy	VK2PJ	NSW Councillor
Peter Mill	VK3ZPP	Victorian Councillor
David Jerome	VK4YAN	Queensland Councillor
Rowland Bruce	VK5OU	SA Councillor
Neil Penfold	VK6NE	WA Councillor
Joe Gelston	VK7JG	Tasmanian Councillor

Federal Co—ordinators

Amsat	Graham Ratcliff	VK5AGR
Awards Mgr	Ken Gott	VK3AJU
Contest Mgr	Frank Beech	VK7BC
Education	Brenda Edmonds	VK3KT
EMC	Hans Ruckert	VK2AOU
Historian	John Edmonds	VK3AFU
Intruder Watch	Bill Horner	VK4MWZ
Int'l Travel Host Exch	Ash Nallawalla	VK3CIT
QSL Mgr	Neil Penfold	VK6NE
Standards	Peter Page	VK2APP
Tapes (Federal News)	Bill Roper	VK3ARZ
Videotape	John Ingham	VK5KG

Executive

Peter Gamble	VK3YRP	Federal President
Ron Henderson	VK1RH	Vice Chairman
David Wardlaw	VK3ADW	Immediate Past Federal President
Brenda Edmonds	VK3KT	Federal Education Officer
Bill Rice	VK3ABP	Editor Amateur Radio
George Brzostowski	VK1GB	Federal Executive
Peter Page	VK2APP	Federal Executive
Ray Roche	VK1ZJR	Federal Executive
Bill Wardrop	VK5AWM	Federal Executive
Kathy Gluyas	VK3XBA	Federal Executive

Executive Office

Bill Roper	VK3ARZ	General Manager & Secretary
Ross Burstal	VK3CRB	Assistant General Manager
Ann McCurdy		Advertising & Admin. Manager
Helen Wageningen		Membership & Circulation Mgr
June Fox		Accounts & EDP Manager
Earl Russell	VK3BER	EDP Consultant
Ron Fisher	VK3OM	Librarian

DIVISIONS

VK1

Address: ACT Division, GPO Box 600, Canberra ACT 2601

Officers		
President	Alan Hawes	VK1WX
Secretary	Alex Johnson	VK1ZDX
Treasurer	Ken Ray	VK1KEN

Broadcasts: 3.570 MHz, 2m ch 6950, 70cm ch 8525, 2000 hrs Sun

Fees	
Full (F)	$44.00
Assoc (A)	$44.00
Full (C)	$44.00
Assoc (T)	$44.00
Pens. (G)	$33.00
Stud. (S)	$31.00
Family (X)	$25.00

VK2

Address: NSW Division, 109 Wigram St, Parramatta NSW 2124, (PO Box 1066 Parramatta), Phone (02) 689 2417

Officers		
President	Roger Henley	VK2ZIG
Secretary	Andrew Keir	VK2AAK
Treasurer	David Horsfall	VK2KFU

Broadcasts: (R Denotes repeater) Times 1100 and 1930 on Sun
1.845 MHz AM, 3.595 SSB, 7.146 AM (1100 only)
28.320 SSB, 52 120 SSB 52.525 FM
144.120 SSB 147.000 FM(R) 438.525 FM(R)
585.500 (ATV Sound) Relays also conducted via many repeaters throughout NSW.

Fees	
F	$41.50
A	$39.50
C	$41.50
T	$39.50
G	$34.50
S	$22.50
X	$24.50

VK3

Address: Victorian Division, 38 Taylor St, Ashburton Vic 3147, Phone (03) 259 9162

Officers		
President	Jim Linton	VK3PC
Secretary	Peter Mill	VK3ZPP
Treasurer	Rob Hailey	VK3XLZ

Broadcasts: 1.840 MHZ AM, 3.615 SSB,
7.085 SSB, 147.250 FM(R) Mt Macedon
147.225 FM(R) Mt Baw Baw
146.800 FM(R) Mildura
438.075 FM(R) Mt St Leonard 1030 hrs on Sun

Fees	
F	$50.00
A	$45.00
C	$50.00
T	$45.00
G	$38.00
S	$27.00
X	$27.00

VK4

Address: Queensland Division, PO Box 638, Brisbane Qld 4001, Phone (07) 349 7768

Officers		
President	David Jones	VK4NLV
Secretary	John Aarsse	VK4QA
Treasurer	Neil Fittock	VK4NEF

Broadcasts: 3.650 MHz, 7.118, 14.342,
18.132, 21.175, 28.400,
52.525 regional 2m repeaters and
1296.100 0900 hrs Sunday
Repeated on 3.605 & 147.150 MHz, 1930 Mon

Fees	
F	$45.00
A	$45.00
C	$45.00
T	$45.00
G	$36.00
S	$27.00
X	$27.00

VK5

Address: South Australian Division, Thebarton Rd, West Thebarton SA 5031, (GPO Box 1234), Adelaide SA 5001), Phone (08) 352 3428

Officers		
President	Don McDonald	VK5ADD
Secretary	Hans van der Zalm	VK5KHZ
Treasurer	Bill Wardrop	VK5AWM

Broadcasts: 3.550 MHz, 14.175, 28.470, 53.100,
147.000 FM(R) Adelaide
146.700 FM(R) Mid North
146.900 FM(R) South East
ATV Ch 34 579.00 Adelaide
ATV 444.250 Mid North
(NT)3.555, 146.500, 0900 hrs Sun

Fees	
F	$44.00
A	$44.00
C	$44.00
T	$44.00
G	$35.00
S	$26.00
X	$26.00

VK6

Address: West Australian Division, GPO Box 10, West Perth WA 6005

Officers		
President	Christine Bastin	VK6ZLZ
Secretary	Fred Parsonage VK6PF	
Treasurer	Cliff Bastin	VK6LZ

Broadcasts: 146.700 FM(R) Perth, at 0930 hrs Sun, relayed on 3.560 MHz, 7.075, 14.110, 14.175, 21.185, 28.485, 52.080, 438.525(R)
Country relays 3.582, 147.350(R) Busselton
146.900(R) Mt William (Bunbury)
Broadcast repeated on 3.560 at 1900 hrs.

Fees	
F	$42.00
A	$42.00
C	$42.00
T	$42.00
G	$35.00
S	$22.00
X	$23.00

VK7

Address: Tasmanian Division, PO Box 1010, Launceston TAS 7250

Officers		
President	Mike Wilson	VK7ZWW
Secretary	Peter Frith	VK7PF
Treasurer	Peter King	VK7ZPK

Broadcasts: 146.700 MHZ FM (VK7RHT) at 0930 hrs Sun relayed on 147.000 (VK7RAA), 146.750 (VK7RNW),
3.570, 7.090, 14.170, 52.100, 144.100 (Hobart)
Repeated Tues 3.590 at 1930 hrs

Fees	
F	$42.00
A	$42.00
C	$42.00
T	$42.00

VK8 (Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz).
Note: all times are local. All frequencies MHz.

WIA NEWS

Bill Roper, VK3ARZ, General Manager & Secretary

THIRD PARTY TRAFFIC

The current literal dictionary interpretation by the Australian amateur radio licensing authority, the Department of Transport and Communications, of what constitutes legal amateur third party traffic in this country, is out of step with the majority of other countries who permit third party traffic operation by their licensed amateur radio operators.

The WIA has been negotiating with DOTC for some time in an effort to ease the unnecessarily harsh contraints of their rulings on Third Party Traffic. John McKendry, an Assistant Secretary with DOTC at the time, gave an undertaking to the WIA at the 1988 Federal Convention, that DOTC would not take any further action about Third Party Traffic until after the 1988 IARU Region 3 Conference in Seoul and receipt of a subsequent detailed submission from the WIA.

You can imagine our surprise when DOTC appeared to dishonour this undertaking by John McKendry when they forwarded a letter, addressed personally to the General Manager of the WIA, on 31st October 1988 setting out their interpretation of the rules for Third Party Traffic operation by Australian amateurs.

This unexpected letter was received only a few days after the Seoul Conference and well before the WIA delegates to the Conference had an opportunity to discuss the findings of the Conference with Executive, let alone prepare a submission.

When tackled at the recent WIA/DOTC Joint Meeting about this apparent breach of undertaking, the DOTC spokesman advised that "the letter of 31st October 1988 was sent to simply clarify the current situation and that DOTC is ready and willing to negotiate".

As a result of the discussions that followed, the WIA is assembling material from the IARU Region 3 Conference in Seoul, the recent United Kingdom DTI rulings, and rulings from other sister societies in order to support a submission to vary the Australian Third Party Traffic rules to bring them in accord with the majority of other countries.

The WIA deliberately did not publicise the letter of 31st October 1988 from DOTC, firmly believing that to do so would only further complicate an already confusing issue.

You can imagine our surprise when this private letter to the WIA suddenly appeared on a packet radio bulletin board, and was subsequently published in at least 2 non-WIA publications.

We know that the letter was not released by the WIA, so the question is, who publicly released this private letter?

Is the DOTC yet another Government Department to 'spring a leak'?

Full details of the WIA submission on Third Party Traffic will be made available in the pages of Amateur Radio, as soon as they become available.

INTRUDER WATCH

Intruder Watch, the service provided by a number of volunteer amateurs who monitor the amateur bands, logging unauthorised non-amateur transmissions and reporting them to the authorities, is a very essential part of the continuing effort by the WIA to protect our bands.

This is a very important operation to the future of amateur radio.

But, for one reason or another, all too few amateurs seem prepared to put in the necessary small amount of time per week to assist. Bill Horner, VK4MWZ, the newly appointed Federal Intruder Watch Co-ordinator, is presently wanting to recruit some more Intruder Watchers, particularly State Intruder Watch Co-ordinators.

For instance, at present, there is no Intruder Watch Co-ordinator in VK2 and VK7; and in VK1 the Divisional President has been temporarily filling in, but would like some relief.

If you would like to put something back into the hobby of amateur radio, from which you gain so much enjoyment, here is an opportunity for you. For a small amount of time and effort each week, you can become an important part of the continuing battle to protect our bands from intruders.

Bill Horner, VK4MWZ, can be contacted by writing to him at 26 Iron Street, Gympie, Queensland, 4570, or by telephoning him on 071 82 5272.

DELIVERY OF AMATEUR RADIO

One of the most tangible benefits of being a member of the WIA is the monthly receipt in your letter box of the WIA journal, Amateur Radio.

Each month just on 8000 copies of the magazine are posted out to members all over Australia and overseas. And each month the Executive Office receives calls from an average of 20 members querying why they have not received the latest copy of AR.

In most cases the post office has temporarily misplaced the magazine and it turns up a few days later than it should have done. In some cases the magazine is returned to the Executive Office with the notation "Left Address" or "Not Known at this Address", when in fact the address is quite correct. And in other cases, changes of address have not been notified to us in time.

The magazine is delivered from the printers to the mailing house on the last Friday in each month. The mailing house normally delivers the wrapped and addressed magazines to the post office within 48 business hours, which usually means on the following Tuesday.

Then it is up to Australia Post. However, bear in mind that Amateur Radio is sent as a Category B item, which is effectively second class mail.

If you have not received your copy by about, say, the middle of the month, and the post office have not temporarily misplaced it, the chances are that you have not renewed your annual membership subscription.

In these circumstances, a quick telephone call to the Executive Office on (03) 528 5962 between the hours of 9.30 AM and 4.30 PM on weekdays, will quickly clarify your membership situation.

2 METRE SIMPLEX CALLING FREQUENCY

The Executive Office has received several complaints recently about amateurs operating in the 2 metre band on the old channel 40 frequency of 146.00 MHz.

I wonder how many new operators on this band realise (and how many old operators have forgotten) that this once common simplex FM frequency causes interference to satellite downlinks?

Please do not use 146.00 MHz simplex FM operation.

And talking about 2 metre FM operation, it is probably worth a reminder that the CALLING CHANNEL of 146.50 MHZ, or the old channel 50, is intended to be just that, a CALLING CHANNEL, and not a frequency for general conversation.

As Arthur, VK7SE, wrote in a recent letter, "We should use 6425, 6450, 6475, 6525, 6550, and 6575, etc. (some of which have been allocated to separate purposes) for general

conversation. This makes it easy to locate others, but if we all talk on the CALLING CHANNEL, well, it's just like tying up a repeater instead of going simplex...."

If you have any doubts about what are the preferred frequencies for your operation, please refer to the Band Plans for the Amateur Service, VHF Bands section, on page 24 of February 1989 issue of Amateur Radio.

IONOSPHERIC PREDICTIONS

I wonder how many members realise that Radio Australia provides a comprehensive ionospheric predictions service 5 times a day at 4 hourly intervals commencing from 4.25 hrs UTC, on Mondays to Saturdays. The information for this service is provided by IPS Radio and Space Services located in Sydney.

Last week the WIA was advised that IPS Radio and Space Services was going to reduce their supply of predictions from 7 days a week to 5 days a week, leaving no service on weekends on Radio Australia.

The WIA Executive Office immediately FAXed off a strong protest to IPS Radio and Space Services, but we have now learnt that the predictions service is definitely being reduced to only 5 days a week.

The good news is that, not only has Radio Australia been able to come to an arrangement with WWV in Boulder, Colorado, USA to be able to obtain predictions over the weekends, but it is expected that in May of this year, Radio Australia will extend their present 6 day a week ionospheric predictions service to 7 days a week.

Mike Bird from Radio Australia is presently preparing a detailed article on his ionospheric predictions service for publication in the April issue of Amateur Radio.

50 MHZ BAND AND CHANNEL 0

As previously advised the WIA is currently negotiating with DOTC with a view to achieving a set of operating conditions for the 50 MHz band which will be acceptable to all Australian radio amateurs, and will permit radio amateurs located in the mainland east coast states of Australia to operate below 52 MHz in coexistence with channel 0 television.

On 20th January 1989 a submission was lodged with DOTC, which included a supporting 23 page technical report. This report examined the technical aspects of sharing between the Amateur Radio Service and the Broadcasting Service of a small segment of the spectrum centred on approximately 50.10 MHz.

A major portion of the report was a discussion which determines a minimum radial distance at which an amateur radio station may operate on frequencies around 50.10 MHz without causing significant interference to a channel 0 television service.

The 7 major recommendations of the report are as follows:-

(a) To conform more closely with international amateur radio operation, the existing shared segment 50.00 - 50.15 MHz should be shifted 50 kHz higher in frequency, with no increase in bandwidth, to a segment 50.05 - 50.20 MHz.

(b) Operation in the proposed shared segment 50.05 - 50.20 MHz by the Amateur Radio Service should be on a strictly secondary non-harmful interference basis to channel 0 television services. If harmful interference to a channel 0 service is caused by an amateur station operating in the shared segment 50.05 - 50.20 MHz that amateur station must cease operation.

(c) In all amateur call areas of Australia, except the ACT (VK1), the following radial distance separation restriction should apply between an amateur radio station operating on 50.05 - 50.20 MHz and any on air channel 0 television service. The proposed radial distance restrictions are:

(i) no amateur operation less than 120 km from a channel 0 main station;

(ii) no amateur operation less than 60 km from a channel 0 television translator station, and

(iii) no amateur operation less than 60 km from any television translator station which has an off-air channel 0 input signal.

(d) In the ACT amateur call area (VK1) the radial distance restrictions in (c) above should apply, except that a minimum radial distance separation of 110 km be allowed from national main station ABMN-0, Mt Ulandra. Maximum transmitter peak envelope power output allowable in the ACT should be 100 watts.

(e) In all call areas where there are operating channel 0 services (currently New South Wales, Queensland and Tasmania) the maximum amateur transmitter peak envelope power should be limited to 100 watts.

(f) In the proposed shared segment 50.05 - 50.20 MHz the only allowable amateur transmission modes should be single sideband suppressed carrier (J3E) and CW (A1A); and finally

(g) All other existing agreements covering the use of the spectrum 50 - 52 MHz for call areas VK5, VK6, VK7, VK8, VK9 and VK0 to remain unaltered if the agreements are more favourable than the above recommendations.

As readers will appreciate, it has been difficult to determine details of a submission which will have a good chance of success, and the WIA appreciates the considerable help and advice received from a number of prominent 6 metre operators.

We understand that the submission has to be examined by something like four separate sections of DOTC before eventually finding its way to the Broadcasting Council. Obviously, we are unlikely to get a decision very quickly, but we will keep you advised of progress.

PACKET OPERATION ON 20 METRES

The Federal Technical Advisory Committee of the WIA (FTAC) has recently received advice from an Australian spokesman for HF packet systems operators that HF packet signals have been heard above 14.112 MHz LSB. This frequency is the International Amateur Radio Union (IARU) Region 3 agreed bandplan upper limit for data modes.

Australian radio amateurs will appreciate that this band plan was detailed in the January 1989 issue of Amateur Radio by FTAC and is proposed for adoption in this country at the coming April 1989 Federal Convention in Melbourne.

The HF packet spokesman was concerned that HF packet operators were not aware of the implications of the upper limit, and the declared sideband in that limit.

He sought publicity for the packet channel frequencies conventionally used on the 20 metre amateur band. These are at 2 kHz spacings and are as follows:-

14.095 - 14.0995 MHz Use with caution and avoid RTTY BBS.

14.100 +/- 500 Hz Time shared beacon service and guard band.

14.101 MHz For QSOs and experimentation.

14.103 MHz For QSOs and experimentation.

14.105 MHz User channels - open access.

14.107 MHz User channels - open access.

14.109 MHz and 14.111 MHz. International forwarding - closed channels - available only for forwarding.

14.112 MHz LSB is upper limit of IARU Region 3 data segment.

PACKET RADIO POSITION PAPER

And talking about packet radio, elsewhere in this issue of Amateur Radio is the long awaited WIA packet radio position paper prepared by FTAC. This paper attempts to establish guidelines and policy, rather than specific detail which will be developed in due course in conjunction with packet enthusiasts and FTAC.

If you are at all interested in packet radio, make sure that you read the paper and provide your comments to your Divisional Federal Councillor prior to the 1989 Federal Convention commencing on 23rd April 1989.

WARC 92

Arguably, never before in the history of amateur radio has there been such pressure on the amateur bands from commercial interests as there is at the present time. As a result of changing commercial and political interest in our frequencies, the decisions made at the World Adminstrative Radio Conference (WARC) scheduled to be held in 1992, will most certainly have far reaching effects on amateur radio as we know it.

The WIA is already well into the stages of preparation for this important event. Make sure that you read the paper on WIA Planning for WARC 1992 which is published elsewhere in this issue of Amateur Radio.

The WIA is the single biggest voice representing amateur radio in Australia. But we need more members.

The more members we have, the more notice government will take of what the politicians class as a minority group.

What are you doing to increase membership in the WIA?

ADVERTISEMENT OF DISPOSALS NEWS ITEMS ON AUTHORISED WIA DIVISIONAL NEWS BROADCASTS

Following representations by the WIA, the DOTC agreed, on 17th May 1985, that authorised WIA Divisional news broadcasts could include the advertising of disposals news items, subject to certain conditions.

This facility has proved to be popular and is regularly featured in the majority of weekly Divisional news broadcasts.

One of the conditions has been that all telephone calls in response to the disposals news items broadcast had to be made to the WIA volunteer contact officer. This has caused problems in some Divisions because of the number of telephone enquiries being received by the contact officer for up to several days after each weekly broadcast.

Some time ago the VK6 Division was permitted by the State DOTC office to broadcast the telephone numbers of the individual buyers and sellers, and this system has been working quite satisfactorily.

The WIA has now requested that this variation to the original ruling be permitted to all Divisions, and I shall advise members of the official response in due course.

However, in the course of discussions with DOTC in Canberra, the DOTC spokesman expressed concern that a number of club stations, including those with packet facilities, appear to have misunderstood the DOTC ruling, and are including disposal news items in their own broadcasts.

He asked the WIA to publicise the fact that the 17th May 1985 ruling permitting this facility limited it to AUTHORISED WIA DIVISIONAL NEWS BROADCASTS only!

COLIN J. HURST, VK5HI

The WIA, the oldest amateur radio society in the world, has survived and grown over the years mainly because of the unselfish efforts of many volunteers.

And, like many other volunteer organisations, the WIA has often accepted the tremendous contributions of many of these volunteers without much fanfare or recognition.

One of these tireless workers behind the scenes (if one could say that of a person who has contributed a regular column "AMSAT AUSTRALIA" to Amateur Radio for the past 6 years) is Colin Hurst, VK5HI.

As you read in last month's Amateur Radio, Colin has now handed over the column to Maurie Hooper, VK5EA, and is taking a well deserved rest from meeting monthly deadlines.

I am sure that all members, satellite enthusiasts or not, will join with me in thanking Colin for a job very well done.

Volunteers of Colin's calibre are few and far between. The WIA needs more volunteers like Colin, and I trust that Colin's well deserved rest is only for a short time.

MEMBERS SURVEY

Have you been wondering what happened to the WIA survey? The one that you pulled out of your October 1988 issue of Amateur Radio, filled in and sent off to the Executive Office.

There was a very encouraging response to the survey, but the problem has been in processing. There have been no paid staff free from other work to key punch the information from each returned survey into our computer, and the processing has been dependent on the availability of volunteers.

At this time, about 75% have been processed, sufficient to give an indication of what the final results may be.

For instance, the average age of members completing the survey is 51.1 years. Not as old as some people seemed to think, and almost exactly the same as the average age of radio amateurs in the USA.

By far the most numerous OCCUPATION is "Retired" (does this simply mean that retired members have more time to fill in surveys?), with "Professional" and "Technical" next in order.

Apart from "Other Employment", the major POSITION of members is as a "Manager" or as a "Supervisor". While the most popular INDUSTRY is "Communications".

MAJOR HOBBIES AND INTERESTS, in addition to amateur radio, clearly showed "Computers" in the lead, followed by "Photography" and "Gardening".

In assessing the performance of the WIA, members indicated that our major FREE SERVICE strength is "Beacons and Repeaters", closely followed by "DOTC/Government Liaison" and "News Broadcasts".

Strangely enough, the FREE SERVICE indicated as needing the most improvement, is also "DOTC/Government Liaison". This is further emphasised as the service that the WIA should give most FUTURE EMPHASIS to.

The major PAID SERVICE strength is seen as "QSL Bureau", closely followed by "Magazine"; the main PAID SERVICE needing improvement is "Licensing and Technical Advice"; and the PAID SERVICE seen as needing most FUTURE EMPHASIS is "Town Planning Advice".

The completed survey results will be available to the 1989 Federal Convention, and will give the Federal Council and the Executive valuable assistance in their discussions about future planning.

ar

TOPICAL TECHNICALITIES

A bitty analysis of the Morse Telegraph Code

The Morse telegraph code has survived in spite of many attempts to declare it obsolete and to banish it from the list of required operating skills. Like many old fashioned ideas it will finally disappear, probably only for the reason that it is old fashioned. Now might be a good time to review some aspects in the light of 'modern' ideas.

A telegraph is an apparatus for transmitting messages or signals to a distance.

An electric telegraph is an apparatus which transmits signals and messages to a distance by making and breaking an electric circuit.

The Morse electric telegraph code encodes messages and signals by assigning to each message character a unique series of makes and breaks. The time duration of each make or break is an integral multiple of the shortest.

For the purposes of this discussion I will refer to the shortest make or break as a bit. The justification for that is the two state or binary nature of the code; additional justification is the fact that binary digits are older fashioned than the Morse code and were elevated to bits only recently.

The Morse code, as any novice will tell you, is a code using combinations of dots and dashes to represent language letters or number system digits. A dot is two bits, a make and a break, a dash is four bits, a make of three bits followed by a break of one bit.

Characters (letters or numbers) forming a group or work are separated by a space three bits long.

A group of characters or a word is separated from the next by a space seven bits long.

In binary numbers a dot is 01 or 10, a dash is 1110 or 0001 and spaces are 000 or 111 or 0000000 or 1111111.

The English alphabet in Morse code has an average letter length of 11 bits including three bits for letter spacing. (Note - the average information value is only four bits).

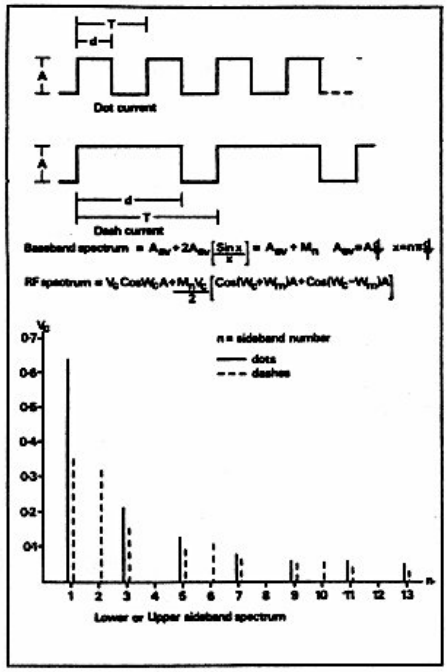
An average word is five characters long, therefore there are 62 bits in the average word including a seven bit space.

Sixty two bits a minute is one word per minute (wpm) or one bit per second (bps).

1 wpm = 1 bps ..... (1)

That approximation is close to the approximation stated in the ARRL handbook and near enough for our purposes. The approximation could be refined by a statistical analysis of word lengths and the relative frequency of each character. Someone else might like to tackle that!

A good telegraphist can send and receive plain language messages at 30wpm and 5 letter code groups at 25 wpm. Those speeds are 30 bps and 25 bps respectively which compares well with 50 baud machine telegraphy.



Relative sideband amplitude

In addition to his code speed an operator could touch type at 50wpm at least and that, coupled with word and sentence abbreviations, resulted in very satisfactory message handling speeds. How many amateur machine telegraphists touch type?

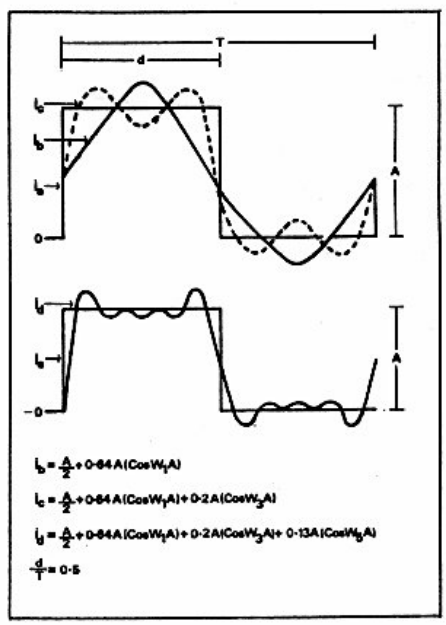
Actual point to point message signalling speeds are not as dependent on telegraph speed as on message handling, typing and etc. There is a parallel with air travel. The time from city centre to city centre in many cases hasn't been reduced, despite a tripling of aircraft speeds.

It seems a waste of effort, except for the experience or the fun of trying, for an amateur net to be capable of 4800 bps to handle 50 wpm typed traffic. There might be justification for including touch typing in the AOCP exam.

'Wireless Telegraphy" is achieved by make and break keying of a radio frequency oscillation coupled to an aerial system. In the beginning the oscillation was generated by a spark gap. The following description of that machine is from a 1903 wireless amateur journal.

"Depressing the telegraph key immediately produced a powerful electric spark between two highly polished metal balls. This spark gap is adjustable the metal balls being set about 2 inches apart. Every tap of the key produced a torrent of 2 inch sparks of great energy, the duration of the sparks being long or short according to key movement. One ball is in direct connection with the aerial, the other ball being always earthed. Every spark gives rise to pecular electric oscillations in the ether which surrounds the molecules of all matter. These oscillations are called Hertzian waves. They radiate in all directions."

And, this recent comment from an old timer - "The spark transmitter was raucous and noisy, only half as efficient as subsequent valve equipment, but, by golly, it was spectacular to the point of being awesome. All radio operators (what happened



Periodic dot Spectrum (Part)

to wireless?), whether sending or receiving, loved its rasping grating noise."

Returning to technicalities. The baseband current waveshapes resulting from key manipulation are illustrated at Fig 1. Repeating dots and dashes at constant speed have the form of Fig 1 (a&b) and for those -

the dot period is 2 bits duration

the dash period is 4 bits

the dot duty cycle is 0.5 , and

the dash duty cycle is 0.75

The PRF from (1) is half the wpm for dots and 1/4 of the wpm for dashes.

The baseband spectrum of the dot and dash periodic currents comprise an average undirectional component plus alternating sinusoidal components which are harmonics of the PRF. Theory asserts that each baseband harmonic component when translated to RF by multiplication with a carrier produces an upper and lower sideband separated from the carrier by integral multiples (1,2,3,4,5..n) of the PRF.Fig 1 illustrates the relative amplitudes of those sidebands.

Note that -

(a) about 80% of the sideband energy is concentrated in the band 2/d hertz, where d is the dot or dash duration,

(b) about 93% of the total RF energy is concentrated in that band.

Therefore the popular practice of 'shaping' keying current waveshape with a low pass filter possibly reduces only 7% of the energy, that which is outside a bandwidth of 20 Hertz at 10 wpm and 40 Hertz at 20 wpm.

Fix 2 represents a synthesised rectangular wave in three stages. That introduces another puzzling feature of the theory. If all the baseband components except the first are filtered out the fundamental will overmodulate a carrier ofthe correct amplitude. Similarly retaining only the first, third, and fifth will result in carrier overmodulation. The higher order components determine the final amplitude as well as the rise time. ar

CLUB WEEK END

Redcliffe's Field Day

Jo-Anne Dudley VK4CYL
Rick Rodgers VK4HF
Redcliffe Radio Club
PO Box 20 Woody Point 4019

Have you ever wondered how to score 12448 points in the multi-op section of the John Moyle?

Serious planning, months of site selection, recruiting seasoned contesters, tonnes of state-of-the-art equipment, countless hours of training, brilliant leadership by a most accomplished DX-er, weather from a travel brochure and bulk good luck?

All of these are important, a combination of most would get you through, but that's not how it happened.

A couple of weeks prior to the '88 John Moyle, a few of us in the Redcliffe Radio Club reflected on our 3rd place result in the '87 contest and decided to test the fluke and go for broke.

A different site from that for '87 was chosen. Then, forestry approval under our belt, the next most important thing on the list was to fill the 190 litre esky with XXXX and ice. Our seasoned contesters were nil. Our equipment was begged, borrowed and stolen. Leadership non-existent ..... and the weather, if any of you doubt that snow and blizzard can be part of life on Qld's Sunshine Coast, then you should have been at Dean's Hill, due west of Caloundra on the day some prawn decided it would be good to go field portable!

After 50% of the equipment was set up, the cyclonic winds brought the rain which heralded the arrival of the good old Aussie blue tarps (spinnakers).

The contest started at 11.00 am local. About this time, our only antenna (40m dipole) snapped under the strain. The soldering iron needed power, the truck-mounted diesel generator needed somebody who knew how to operate it.

Meanwhile the tri-band yagi with a reflector at each end, (obviously Marconi's first attempt) was fighting the wind on a 12m lattice mast. Just how did Charlie VK4YZ manage to erect this?

Half our operators were late arrivals, having first to circumnavigate the world in an endeavour to follow the simple directions.

VHF/UHF was eventually operational but the contest had started 2 hours before. Club president arrived. Ignoring comments like,

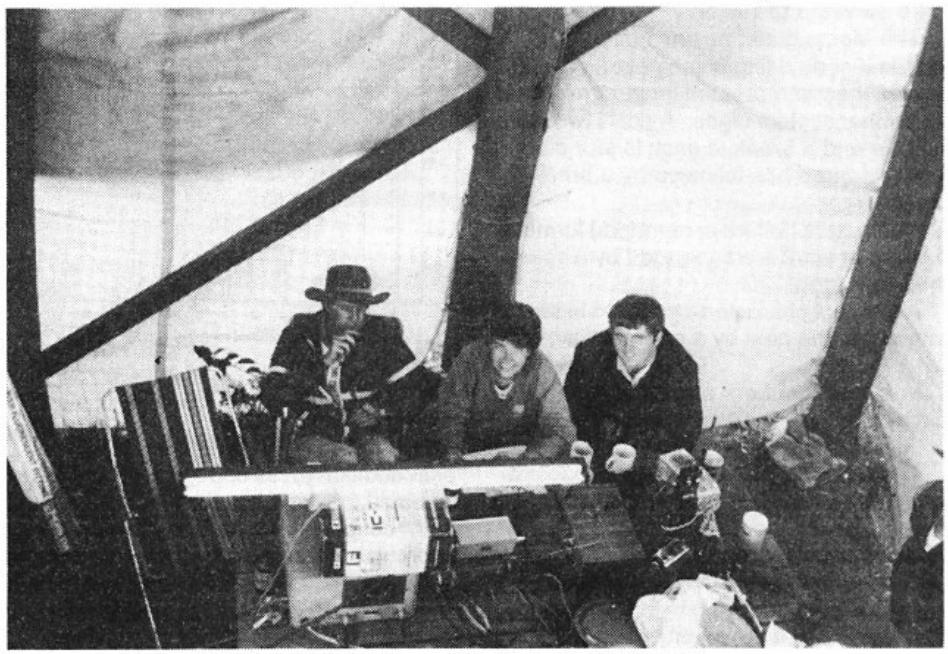
'Where's the snow plough?' he uttered the memorable comment.

'It'll clear in half an hour'.

Apart from all this, everything went as planned!

We worked a pile of J's on 6m courtesy of a 2m mobile whip, complete with directional magnetic base and RG58 coax.

ZL's were lining up on 40m to work us. Bob VK4MR was working the world on 10.



From left Rick VK4HF, Jo VK4CYL, and the "Zerk" (VK4ZRC). Note the clever positioning of equipment.

Paul VK4NCC and his family had positioned the 4-wheel drive Valiant Charger in a seemingly irretrievable position.

Situation normal

With this well oiled contest machine, all working in unison towards a common goal, yours truly, VK4HF adjourned to the 190L esky, but alas, shock! Horror! the Zerk (not short for ber-zerk, but for VK4ZRC) was already feeling no pain!

After hours of calling, and original logsheets looking like James Cook's first attempt to circumnavigate the bathtub, 11pm had arrived, and the contest was half over. By now the young, the sick and the elderly, had joined Zerk in the land of nod.

'Twas here that the men were separated from the boys. We all awoke at 7am to find our reliable Kilowatt Texas Boston (alias KW4KTB Trevor) still at the wheel of his 520S. Having spent the entire night punching holes in 80m, the lines on his eyes closely resembled his logsheet.

Mid-Sunday morning found the sun drying out the wreckage that we lovingly called Radio and Camping equipment. We finished our 24 hour section looking like spat-out lollies and with a feeling of apprehension, wondering how we stacked up against the rest.

Lowering the 40' mast and the tribander, the two became separated in mid-lower. How the beam and rotator missed everybody, was the first bit of good luck we'd had all weekend! After surveying the bent and twisted TH3, it was decided that it was fortunate that the owner of the equipment had elected to stay home.

Five tonnes of radio equipment, three tonnes of camping gear, twenty tonnes of rubbish, a lot of weary looks later, we all headed off in our separate directions, rabbling on 2m - recalling some of the more humorous moments of the weekend.

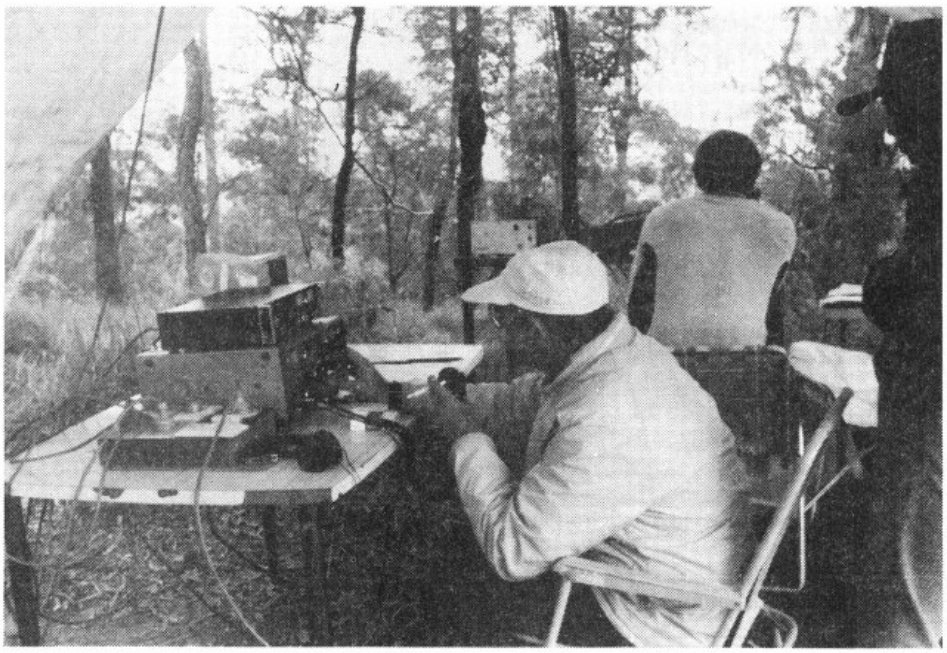
Monday: The Redcliffe Radio Club met at 7.30 pm with half a dozen of us rewriting and scoring logsheets. Already we had noted areas where we could improve, but would it be as much fun?

The '89 John Moyle will see the use of some of our most dastardly secret weapons, and hopefully better tactics. So fasten your seat belts - and watch out for VK4IZ!

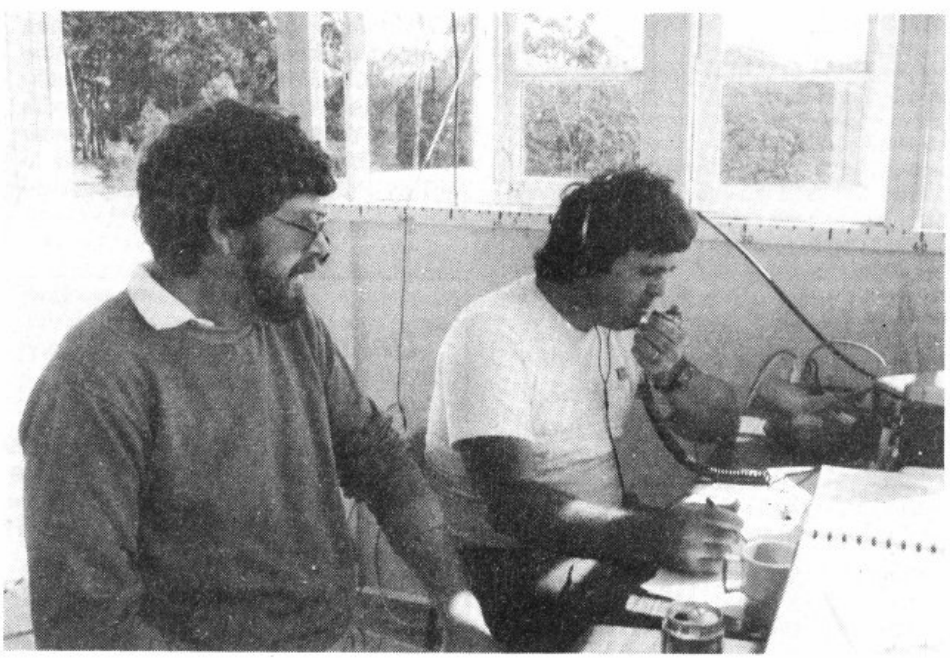
FOOTNOTE:

Special thanks to those members of the Redcliffe Radio Club who worked so hard to put this successful weekend together.

Trevor VK4KTB, still at the wheel of his 520S.



Bob VK4MR to VK4KRJ Joe, "Faster Joe, faster!"



5/8 WAVE

Nominations?

With last month's magazine you should have received your form for Council Nomination. I wonder what happened to it, did you even consider standing? So many people whinge and moan on the air, when they could be a member of Council and really make their opinions count. If it isn't already too late, have another think about it and get the form filled in. Next month we hope to have a list of nominees for you to vote on. Once again, you get the chance to have a say in who represents you and works for you on Council. Don't Forget that our AGM this year will be held on the 2nd of May as our normal meeting night would fall on Anzac Day.

The Clubs' Convention will be held on the weekend of 7th-8th-9th of April. If you haven't sent in your agenda items, I would say that it is too late for those going to the Federal Convention as they had to be in Melbourne by March 15th (and they first have to go to a VK5 Council meeting) there may still be time for the local ones though. No doubt we shall, once again, be very pleased to hear from anyone who could help with the catering.

I'm not sure if it was the excitement of seeing Bob Hawke and Angry Anderson, all in the same day, or the stress of helping to look after all those Scouts at the Jamboree, but shortly after all these events we were informed that our President Don McDonald VK5ADD, had undergone some Heart Bypass Surgery at the RH. I'm pleased to report that at the time of writing, Don is making a good recovery and we hope that it continues.

Diary Dates

Tues 28th Mar:	Speaker for our general meeting will be Rick Matthews (ex VK5ZFQ) on 'Cellular Phones' 7.45 p.m.
April 7-8-9	Clubs' Convention weekend at Aldinga Beach
April 25th	NO MEETING
May 2nd	A G M
May 12th-21st	Display Station at EXPO (Wayville Showgrounds) lots of volunteers will be required to help with this event.. ar

VKS WORK MIR

Aussies chat with space

Jim Linton VK3PC
4 Ansett Crescent
Forest Hill 3131

Researching this story has been difficult because the Russian cosmonauts were not available for interview for their side of the story. It was not possible to check their log record. The author hopes further research on the MIR operation will verify historical aspects of the communications between the cosmonauts and VK radio amateurs.

History was made when Australian radio amateurs communicated with a cosmonaut on the orbiting Russian space station MIR — believed to be the first communication of its type between east and west.

It took the Russian Government's policy of glasnost (openness) to a new frontier — space.

Two cosmonauts, Mousa Manarov and the station commander, Vladimir Titov, had been given permission to transmit while off duty from space station tasks using low-powered transceivers on the amateur radio VHF two-metre band.

The MIR amateur station consisted of a quarter-wave ground plane antenna mounted outside the spacecraft by the cosmonauts during a space walk to carry out repairs to the KVANT module, and a two watt Yaesu FT290R FM transceiver donated by UA6HZ and transported to MIR by Progress 38 space freighter on September 9 1988.

The transceiver was expected to be upgraded to a 10 watt version during crew changeover last December.

This is the story about three radio amateurs - Tadge Zaremba VK6ATZ in Bunbury, Andy Squires VK3DTO of Horsham, and Bob Arnold VK3ZBB in Melbourne.

Andy is believed to be the first Australian to hear Mousa U2MIR on November 14, during a pass over Australia and he finally worked U2MIR on November 16.

"I heard Mousa calling CQ (on November 14) and tried to work him using a split frequency," Andy said.

Among a considerable amount of disinformation spread about MIR was that the cosmonauts would use different transmitting and receiving frequencies - this turned out not be be true.

After hearing U2MIR Andy alerted Bob and others who were waiting the next day planning to contact U2MIR simplex.

Unaware of the excitement and anticipation in VK3 about the space station, Tadge was transmitting ATV and looking for a contact, when by sheer accident he worked the space station.

John Zaremba, aged 7, called out to his father that UHF channel 28 was being received with a clear picture from Perth.

Unknown author!

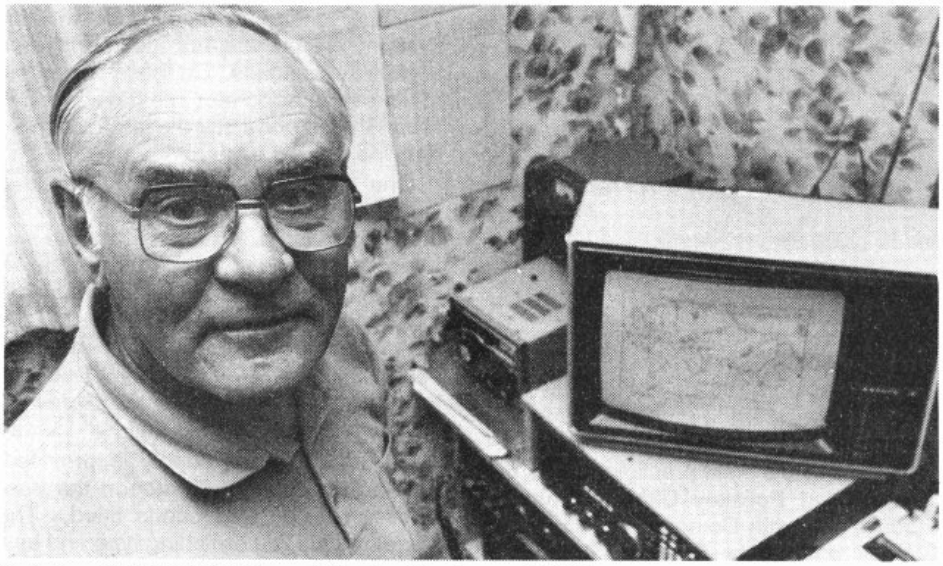
We have received a two-page article on a QRP CW transmitter based on AR articles in April 1986 and January 1988. The envelope was postmarked Adelaide some time in January 1989, but the precise date is unreadable. The author gave neither his name nor call-sign. Would he mind letting the Editor know who he is, please?

This is an indication that the 70 cm amateur band is open.

Tadge went to his shack, turned on both 70 cm and two metres. He called the regulars on ATV using what he thought was the ATV liaison frequency of 145.500 MHz.

"In my excitement (at the thought of a 70cm opening for ATV) I dialed 145.550MHz," he said.

"Then I noticed that the mute was breaking and then someone calling CQ, so I answered with my callsign, and he replied with his callsign U2MIR."



Bob Arnold VK3ZBB, Second Australian to work MIR

Tadge being sceptical paused a moment to consider whether he was the victim of a prank. "Then I asked him his location so that I could beam on to him - thinking he could be on a ship - and he replied he was in space."

The contact then faded, and Tadge looked at his clock to log U2MIR at 1021 UTC. The antenna system was a skeleton slot pointing due north.

Closely behind Tadge's flukey contact was Bob, who had his two metre satellite beam programmed to track the MIR orbit to achieve the second contact with U2MIR.

Initially it was thought Bob was the first VK to make contact with U2MIR. But a close listen to a tape recording made by Andy found Mousa acknowledging VK6ATZ prior to VK3ZBB.

Thanks to Harry Atkinson VK6WZ, the WIA Western Australian Division broadcast officer, Tadge was tracked down and his remarkable story revealed.

Andy recorded the transmissions from U2MIR, but disappointingly was not able to make contact himself until the following day.

Bob, a radio amateur for 50 years, and a keen satellite enthusiast had been keyed up for some days waiting a chance to contact the station. He had also supplied regular bulletins for the WIA Victorian Division VK3BWI broadcast about the prospect of working the space station and provided updated information on the expected frequency of operation.

An elated Bob rang Jim VK3PC minutes after making contact to give him the news, which was quickly converted into a WIA news release and issued to the media.

Commercial and ABC radio interviewed Jim Linton as WIA Vic Div President about the history making event, and the interviews were played on stations throughout Australia.

The following day newspapers, radio and TV stations were eager for more details. The Muriel Cooper afternoon chat show on 3AW lined up to interview Bob, who also roped in Andy.

Muriel Cooper asked Bob how he felt having spoken with space, and he replied "I was absolutely over the moon, it was tremendous, to me a tremendous thrill."

He told listeners how in a brief transmission Mousa U2MIR said: "My name is Mousa and I am in the space station MIR, which means peace".

Andy had recorded the voice of Mousa, and by playing this down the phone-line the many listeners to the programme heard the signals from space.

Bob had been waiting for U2MIR since learning the cosmonauts had on the previous weekend made contact with radio amateurs in the Soviet Union.

The transmission from VK3ZBB was brief and in the style of a true gentleman he left the channel clear for others.

"I didn't want to hog the frequency so others could have a chance, so I kept my conversations very short and just wished him all the best for the future," he said.

There was an obvious admiration of Manarov and Titov, who Bob described as space pioneers who having spent 12 months in orbit had been in space longer than any other person.

Both returned safely to earth in December. Manarov and Vladimir U1MIR later spoke to radio amateurs in Australia and overseas.

Andy's tape also recorded U2MIR acknowledging George Nelson VK4GF in Maryborough, possibly the third VK contact.

Some time later Angus Garland VK4QV of Brisbane made contact. Network 10 television were keen to interview a radio amateur who had contacted MIR, and the WIA helped them track down Angus.

He was interviewed about his achievement, and effectively used the opportunity to plug our hobby's role in international relations. Network 10 used the interview on its evening news in Brisbane and Melbourne and possibly elsewhere.

Angus said later he was quite sure the cosmonaut he contacted told him in a deep, fairly gruff and slowly spoken voice: "I am Valeri."

This raised the possibility of him contacting cosmonaut Dr Valeri Poliakov who can only speak Russian. Was Valeri trying his hand at talking to the west with limited English phrases under the supervision of Mousa?

AMSAT bulletins reported that it was not until December 1 that Valeri U3MIR came on air speaking Russian only. Another unconfirmed aspect to the story which only the Russians can clarify.

Tadge Zaremba VK6ATZ, First Australian to work MIR

Angus described his contact as being "just a sheer fluke". He set his Yaesu FT480R on scanning mode across the expected MIR frequencies and went to bed, and soon after heard U2MIR at good strength.

After trying to make an initial contact using low power, Angus rushed to his shack and with a linear amplifier feeding a co-linear vertical snared a contact, and wished Valeri all the best from Brisbane.

In the days ahead many radio amateurs lined up waiting for a shot at MIR. Sadly

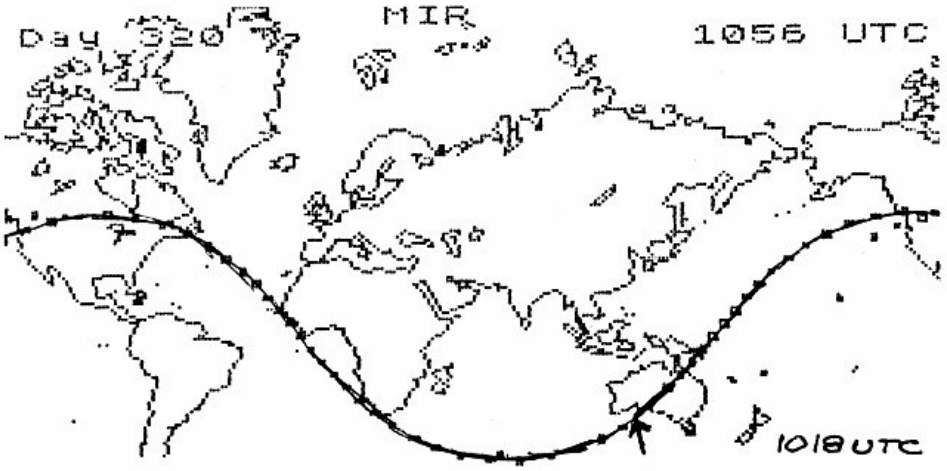


Figure 1: MIR subsatellite track of orbit on which contacts were made

some VK stations waiting for MIR chatted with each other on the prime channel and missed MIR which moved to an adjacent clear channel.

In the northern hemisphere there were reports of chaotic pile-ups which from observations on earth appeared too much for the tired cosmonauts.

There were clear indications that MIR could have been silent for several days after working VK, before the next crew rest period enabled contacts with the United States and Europe.

If you worked either U1MIR or U2MIR the QSL information is via UW3AX, B. Stephanov, PO Box 679, Moscow 107207, USSR.

Mousa Manarov and Vladimir Titov with French cosmonaut Jean Loup Chretien returned to earth in December on board a Soyuz TM-6 space capsule. They were named Heroes of the Soviet Union after a record-breaking 366 days in orbit. And French President Francois Mitterrand bestowed on them the Legion of Honour, one of France's most prestigious awards.

Dr Valeri Poliakov U3MIR remained aboard MIR with Commander Alexander Volkov and Flight Engineer Alexander Serebrov who are scheduled for an extended stay. Valeri is expected to return to earth in the European Spring this year.

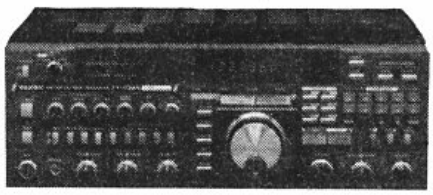
The MIR station will continue to operate on the amateur bands with future crew expected to use progressively the calll-signs U4MIR through to U0MIR. ar

REVIEW

FT736R Multiband Multimode Transceiver

By Gil Sones VK3AUI,
30 Moore St,
Box Hill South,
3128

The FT736R is a rather large and in some ways daunting transceiver. Four VHF/UHF bands can be provided in the one case with all modes available. ATV on the 1296 MHz band is also possible with an adaptor. The standard basic transceiver comes with 144 MHz and 432 MHz as standard. Additional modules can be fitted for 52 MHz and 1296 MHz if so desired at extra cost.



Modes which are provided are SSB, CW and FM with a wide range of features and operating conveniences. Many of the features are the result of the advanced computer driven design whilst others are provided by circuitry. The receiver sports IF Shift and a Notch together with a noise blanker. The transmitter has a speech processor and VOX. Preamp switching is provided to control external preamps which you may desire to incorporate in your system. These are not incorporated or sold as accessories. On these bands any really serious operator will have one between the antenna and the large diameter hardline coaxial cable.

One hundred memories are provided plus call channels and a variety of other memory features. Extensive satellite features are provided which should be of interest to those who work the repeater in the sky. Terrestrial repeaters also have extensive features provided. This may seem an overkill but even with such a transceiver, it may sometimes be necessary to resort to the repeater.

An inbuilt power supply is provided. This power supply will support the transceiver with all four bands fitted. The power supply is a switching type and as a result of the circuitry used, can accommodate a wide range of input voltage. This could be quite handy if you live in an area with a wide range of supply voltage variation. Protection from supply voltage spikes is provided by VDR's.

Specified output is 25 watts on 144 MHz and 432 MHz and 10 watts on 52 MHz and 1296 MHz. Quite adequate to drive any of the popular external amplifiers for serious work. The review model easily met these specifications on all four bands.

The receivers on the four bands are of good sensitivity and whilst not measured, gave a good account of themselves on all four bands. On 432 and 1296 MHz dual gate GASFETS are used. These provide a low noise front end and with a masthead preamp would provide an outstanding receive system. In the transceiver, they are of course at the mercy of the coaxial cable that you put in front of them. For these bands only large diameter hardline really cuts the mustard.

The circuitry used on 52 and 144 MHz shows promise of good performance in the face of strong local signals. However, it was not possible to evaluate this feature objectively. No obvious evidence of such problems was evident.

Operation of the transceiver was simple. Some reference to the manual must be made as the range of features is so large. Indeed to make intelligent use of the capabilities of the transceiver would take a

considerable degree of familiarisation. So set aside some time to learn how to drive it after you take delivery.

The scope of the features and operating facilities is quite amazing. The control system is very sophisticated and really provides every conceivable feature.

Servicing the FT736R should be relatively straight-forward once you have got over the fright of viewing the circuits. Ideally you should leave this side of things to an expert as it is really a very complex and sophisticated piece of equipment. Bul-Inose pliers, a large screwdriver and the old scope soldering iron really have no place in servicing such equipment. All the boards are readily accessible and the front panel hinges to expose the processor and display circuitry.

On air the transceiver acquitted itself creditably although it was not possible to find a DX dogpile on six or some really weak and elusive DX on the other bands.

The transceiver is well packed and protected.

Minor annoyances were the lack of a microphone in the standard package as well as the lack of a DC lead. Both are available as accessories. However, their exclusion with such an otherwise well presented transceiver would seem to be an oversight. Yaesu still have some room to improve.

The connector used for 144 MHz was the familiar UHF type. The Type N would be preferable on this band and indeed would be welcome on 52 MHz as well. Both the 432 and 1296 MHz connectors were Type N. At VHF and UHF a constant impedance connector is essential for the serious work that the FT736R is capable of.

The only hard part about the FT736R is paying for it. The price must be viewed in perspective with what you get. No so long ago such a piece of equipment would have been inconceivable. We pay similar prices for other technological marvels. So dig deep and help populate the VHF and UHF bands. ar

60 YEARS OF RFDS

John Flynn Place - Cloncurry

Alan Shawsmith VK4SS
Historian
WIA Queensland Division

A ceremony of great historical significance to amateurs past and present and all people of the Outback took place on the 4 October 1988 at Cloncurry in north-west Queensland. On this day John Flynn Place was officially opened by the Duke and Duchess of York, Prince Andrew and Sarah (Fergie).

Construction of John Flynn Place was largely a community effort by the people of Cloncurry and surrounding areas as their part of an Outback Bicentennial Project to commemorate the establishment of the Royal Flying Doctor Service, previously the Australian Inland Mission (AIM), at Cloncurry in 1928 by the Rev John Flynn. To date the project has cost approximately $2 million. It will function as a town memorial and tourist centre and houses a cluster of five separate entities, viz:

Alfred Traeger Cultural Centre
Allan Vickers Outdoor Theatre
Fred McKay Art Gallery
Royal Flying Doctor Service Museum
Cloncurry Gardens

Areas of most interest to visiiting radio amateurs are the Alfred Traeger (VK5AX/VK8XT) Cultural Centre and Royal Flying Doctor Service Museum. On display are various exhibits from the first ever pedal wireless and mechanical morse keyboard (brain-child of VK5AX) to the present modern SSB State of the Art.

John Flynn's persistent dream in the early 1920s as a minister of the AIM was to provide 'A Mantle of Safety' for those who ventured into the frightening isolation of the Australian Outback. He understood the potential of radio communication, particularly in these areas, because he was a radio amateur using the callsign 8AC and a WIA member. However, the first main obstacle to the realisation of his dream was the ready availability of a regular power source. The accumulator, or car battery, needed regular re-charging and was prone to fail in times of crisis. One lucky day in 1926 Flynn met Alfred Traeger who listened to the problems and shortly after (1927) came up with a solution which led to the development of the now world famous pedal radio and the mechanical morse keyboard - both incredible pieces of ingenuity for their time.

At this point it may be pertinent to mention a few, just a few, of those radio amateurs who laid the groundwork for what would become the Australia-wide Royal Flying Doctor Service (RFDS):

1. Hudson (Later Sir Hudson) Fysh VK2EF (SK) of QANTAS, who discussed with Rev Flynn the possibility of an Outback Aerial & Medical Service (1921) and made concrete suggestions for its establishment.

2. Alfred Traeger VK5AX (SK) mentioned above.

3. Harry Kinzbrunner VK4HK (SK) who worked closely with Traeger for many years in a technical capacity.

4. Vern (Marconi) Kenna VK4FK/VK2JR (SK). He re-wrote the Flying Doctor Service constitution to give it a Royal Charter and enable it to become the RFDS in 1955.

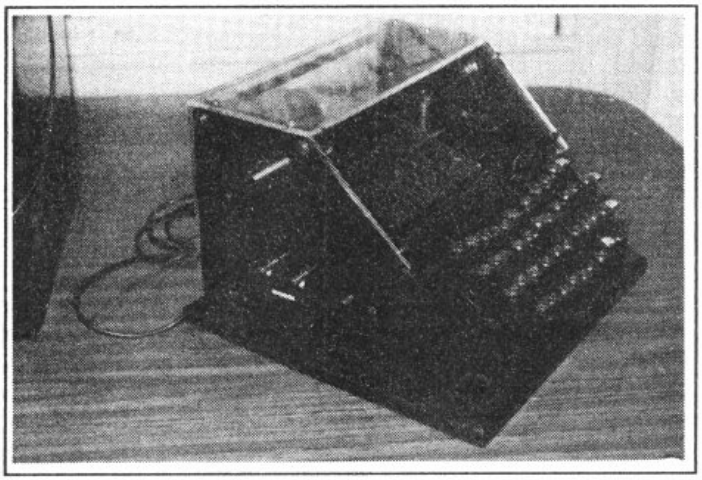
5. Maurie Anderson VK5MA (SK). First wireless operator with AIM's Australian Aerial Medical Service at its first base in 19928 at Cloncurry.

6. Vernon Kerr VK4LK (SK) spent 43 years with the Service as technical officer, controller and announcer. He became one of the best-known voices in the west. He was honoured by the Society of Wireless Pioneers with Life Membership.

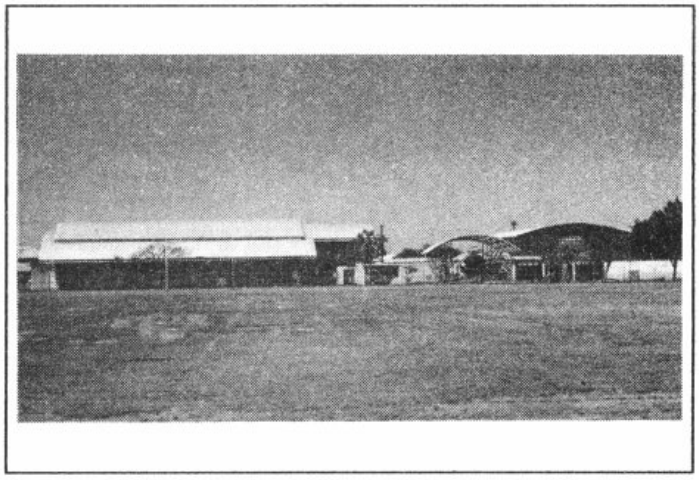
7. Rev Fred McKay CMG MBE VK8YS. As Flynn's successor he has spent a lifetime expanding and updating all RFDS facilities.

One radio amateur who played his part in setting up the display of early equipment for the Royal opening was Mervyn Eunson VK4SO. Merv has been a long time supporter of the RFDS, spending endless hours restoring and classifying equipment right back to the first pedal sets. It was realised that Prince Andrew might want to operate a sixty-year old set. Because of his specialised technical knowledge, Merv was sent for immediately.

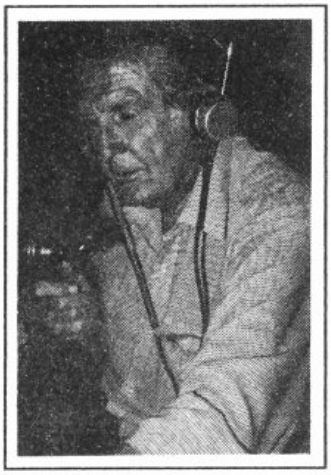
He received an official invitation from the John Flynn Place Committee to attend the opening in the presence of their Royal Highnesses, the Duke and Duchess of



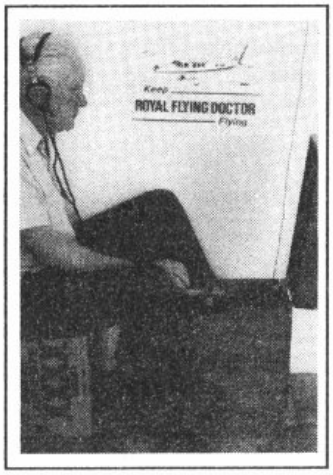
A unique instrument - a morse typewriter used by Flying Doctor pre War 11. Max speed 10 wpm



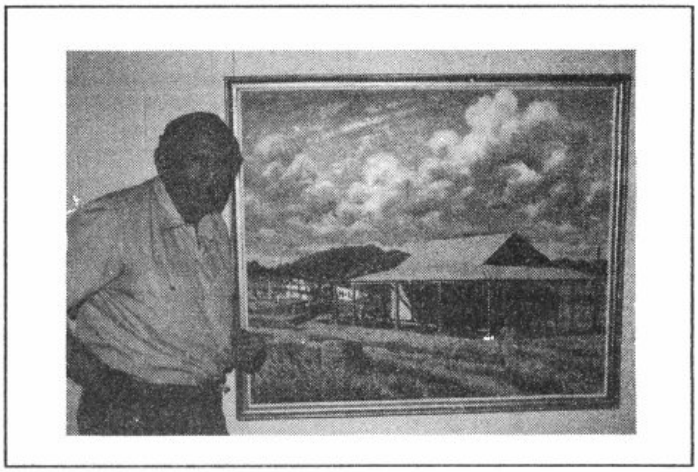
Cloncurry's centrepiece - John Flynn Place



Padre Fred 8 YS remembers the drill



Mervyn Eunson VK4SO operates a portable pedal set. The big question is the XXXX carton full or empty?



Padre Fred 8YS shows the first base at Cloncurry. Who can know the toil, heartbreak, blood, sweat and tears between this shed and the erection of John Flynn Place

Alf Traeger VK5AX and his technical miracles 1928

York. Prior to the big day, Merv spent a fortnight bringing the vintage gear up to its best condition for display - the very first pedal transceiver (No 1) built by Traeger, the original portable set used by Patrol Padre Fred McKay, and that now famous mechanical morse typewriter. Merv found there were no radio amateurs in Cloncurry but those in Mt Isa, in the true spirit of the fraternity, provided him with any assistance within their means.

Merv sought only to get on with the job in hand but, even so, he turned out to be something of a celebrity being interviewed by the local radio stations, journalists for various newspapers and taped for an overseas broadcast segment on all aspects of Flying Doctor history. He was even asked to thumbnail the early history of pedal radio from the pulpit of the Presbyterian Church's Sunday morning service (not bad for an Irishman!) Quite by chance he became the 'toast of the town' - the drinking fraternity that is, which is considerable in 40 C+ heat. On his first visit to one watering hole, he was asked to spin the Lottery Wheel. He hit the jackpot for every drinker in the pub and was consequently chaired shoulder-high and deposited on the bar - and for the next hour the rest can be guessed.

Association with so much Flying Doctor history and the eyeballing of those pioneers still living, particularly Rev Fred McKay and the widows of Vern Kerr, Harry Kinzbrunner and Alf Traeger - to mention just a few - were humbling and unforgettable experiences for Merv. So many friends made in such a short time could only happen in the Outback!

A visit to John Flynn Place Cloncurry is a MUST for all radio amateurs travelling in outback NW Queensland. Like the Stockman's Hall of Fame, it is destined to become a landmark in VK4 - a place of pride - for without the tireless efforts of the abovementioned members of our early fraternity, John Flynn Place could still be a dream rather than a reality. ar

AN OVERVIEW

The resuscitation of VNG

Marion Leiba
Honorary Secretary,
VNG Users Consortium
26 Fimister Circuit, Kambah, ACT
2902

The August and October 1988 "Over to You' sections of Amateur Radio included letters written by me outlining progress in the resuscitation of VNG. Listeners to Mike Bird's "Communicator" programme on Radio Australia each Sunday will know that much has happened since then and that the story of VNG has turned into a veritable saga! Consequently your Executive has asked me to write this article giving an overview of the "adventures of VNG" since its closure.

What is VNG?

VNG is Australia's standard frequency and time signal service. It is a high frequency radio station transmitting accurate time signals on stabilised carrier frequencies. In addition to amateur radio operators, its users included seismologists, astronomers, upper atmosphere physicists, surveyors, yachtsmen, geophysicists studying the Earth's magnetic field, and electric power networks. It is used in Australia, neighbouring countries, and Antarctica.

There has been some speculation regarding the origin of the call sign, VNG. Immediately after it was turned off, there was a newspaper article stating that VNG stood for "very narrow gauge". As far as I can ascertain, there is no substance in this assertion. VNG may have been a randomly allocated call sign, or the last two letters may have been derived from the call sign, XNG, which belonged to time signals transmitted from OTC coastal radio stations twice a day for marine navigation. Maybe the NG stood for "navigation"!

The demise of VNG

For 23 years, from 21 September 1964 to 1 October 1987, VNG broadcast from Lyndhurst, Victoria. It was funded by Telecom Australia, and the R&D and monitoring were done by Telecom Australia Research Laboratories at Clayton. It was switched off because Telecom no longer needed VNG and because the Government wanted to sell the Radio Lyndhurst site in 1988. Telecom offered either to run VNG at $12000 per month until March 1988, or to give the VNG equipment free of charge to any organisation willing to run it. It warned that VNG would cost prospective bodies $144000 pa to run, and that they would soon be up for a capital outlay of over $1 million to replace the transmitters, as they are about 20 years old. No organisation was prepared to take sole responsibility for VNG under those conditions, so at 0000 UTC on 1 October 1987, Max Fowler, the OIC at Lyndhurst, had the sad duty of switching off his third HF radio station for the year. The ABC's VLH and VLR had suffered a similar fate in June 1987,. Max had been at Radio Lyndhurst since 1950. He retired in February 1988 - the ending of an era.

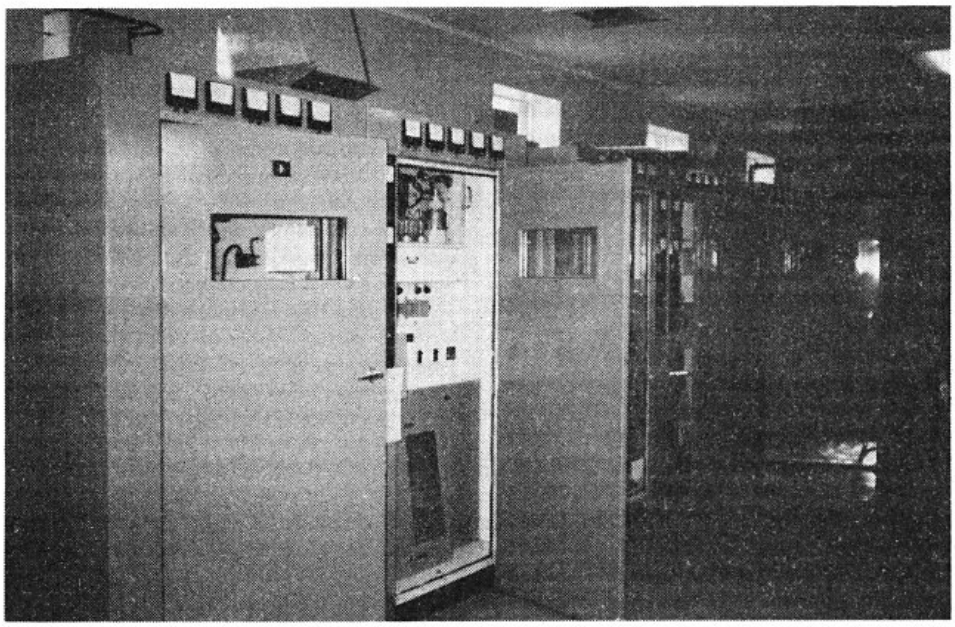
What next?

On 1 December 1987 the National Standards Commission called a meeting of former VNG users and other interested parties to decide what action, if any, should be taken to ensure that Australia had a medium accuracy (ie millisecond accuracy) time signal service following the closure of VNG. The National Standards Commission's interest in time is through its Precise Time Working Group consisting of Dr John Luck (Orroral Geodetic Observatory), Dr Grahame Harvey (National Standards Commission), Mr Ian Harvey (National Measurement Laboratory, CSIRO), and Mr Rob Harris (Telecom Research Laboratories - he used to be in charge of VNG). Nearly 100 people attended the meeting and resolved that the Precise Time Working Group should investigate ways of reviving VNG.

During the ensuing two and a half months, the Precise Time Working Group identified a prospective site for VNG at Llandilo, and obtained Telecom's agreement to donate the VNG equipment to the National Standards Commission.

The VNG users consortium

In mid February 1988, Grahame Harvey and John Luck phoned me about the necessity to remove the VNG equipment from Lyndhurst. The site was expected to go up for sale possibly as early as March. While Telecom was supplying the VNG equipment free of charge, it was going to charge $4500 for its dismantling and packing. As there was insufficient time to arrange Government funding for this, it



The three VNG transmitters at Liandilo on 7 November 1988. The transmitter nearest the camera is tuned to 4.5 MHz; that in the centre needs one week's work to be operational; the farthest is in use for the 5.0 MHz transmission.

was necessary to ask users for contributions. It was not considered appropriate for a Government body to write asking people and organisations to dip into their own pockets, so we decided to form a VNG Users Consortium.

The committee of the VNG Users Consortium consists of Dr John Luck (Chairman), Mr Ian Harvey (Vice Chairman), Dr Gary Hovey (Mt Stromlo Observatory - Treasurer), Mr David Herald (Canberra Astronomical Society - Assistant Treasurer), Mr Gary Gibson (Seismology Research Centre, Phillip Institute of Technology) and myself (an Earthquake Seismologist).

Our inaugural meeting was held on 25 February 1988 and we decided that our objective would be "to re-establish and maintain a national HF standard frequency and time signal service". We also agreed to mail a letter to all known VNG users requesting contributions to equipment acquisition costs, and to the running costs, if necessary.

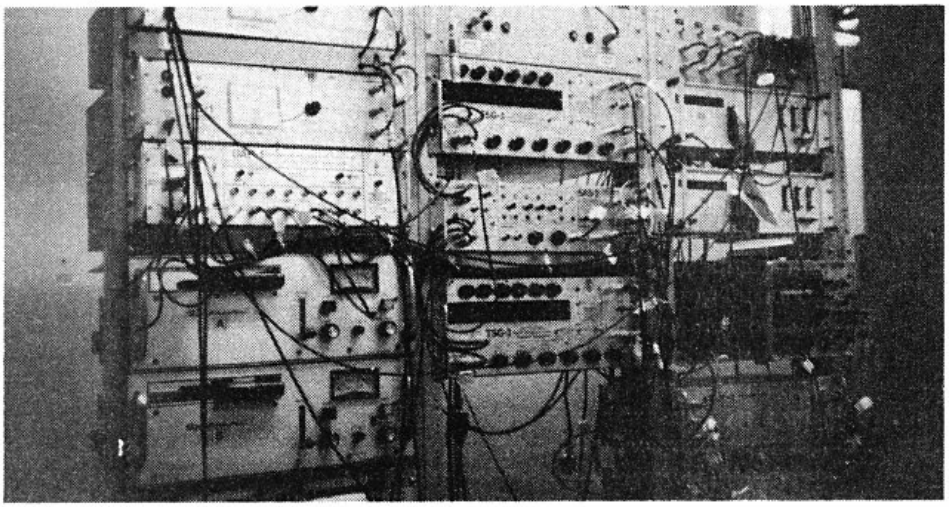
The response

The response from VNG users and sympathisers has been heartwarming. Private individuals (many of whom are not paid for the activities for which they use VNG) have contributed $2 - $100 out of their ownpockets to save this national facility. One of these, an amateur radio operator, was unemployed at the time, but he still contributed because he felt strongly that we should have our own standard frequency and time signal service. I was very touched by that gesture.

Organisations, small and medium-sized, paid $20 - $2000 each to the Consortium. One small firm not only gave $500 for equipment acquisition, but also pledged $200 towards the running costs. It was not till they had heard the first new VNG time pips and voice announcement that they admitted that they had thought that what we were trying to do was impossible.

To date, the VNG Users Consortium has collected over $10000 from 55 users and sympathisers, enabling it to pay for the dismantling and packing of the equipment and its transport from Lyndhurst to Llandilo.

AUSLIG (the Australian Surveying and Land Information Group of the Department of Administrative Services) has paid the setting up costs at Llandilo. The balance of Consortium equipment acquisition funds will be used to partially re-imburse AUSLIG for this.



The VNG frequency and time signal generation equipment at Llandilo

The move north

The new site for VNG is the Civil Aviation Authority's International Transmitting Station at Llandilo, north-east of Penrith, NSW. The bulk of the VNG equipment was moved from Lyndhurst to Llandilo by commercial carrier (the timing equipment and four transmitters occupied an entire semi trailer) on 16-17 June 1988. The remainder, 14 large capacitors containing PCBs, was transported to the new site by a relay of two pairs of VNG users, in a private vehicle, on 1—2 July 1988. The transmitters were so big that the doorway of the transmitter hall had to be enlarged to admit them!

First pips from Llandilo

As a result of some very hard work by the people at Llandilo, the initial VNG test transmission took place from there on 11 August 1988 on 4.5 MHz and 2.5 kW. A second test commenced on 12 August on full power (10kW). These tests were purely to test the equipment and were not on time.

On 17 August, staff from Telecom Research Laboratories and National Measurement Laboratory installed and set a rubidium standard and put VNG on time. The voice announcing cartridges were inserted for the first time in 10 months and those of us present for the occasion celebrated with champagne! The voice was that of Radio Australia's Barry Seeber and the announcement was recorded free of charge by Radio Australia.

The problems start

Our celebrations were short-lived. With the appearance of the voice annoouncement, complaints started coming in from operators in the Sydney area, who had been allocated frequencies close to 4.5 MHz, that VNG was drowning them out. On 18 August, the Radio Frequency Licensing Branch of the Department of Transport and Communications ordered that VNG be switched off until the problem was sorted out.

At a meeting between Radio Frequency Licensing, the Precise Time Working Group and Llandilo on 21 September, it was pointed out that VNG's old frequencies, 4.5, 7.5 and 12.0 MHz, are outside the bands in the Australian Radio Frequency Spectrum allocated to standard frequency and time signal services. The complaints from local operators were also discussed. DOTC wanted to allocate 5.0, 10.0 and 15.0 MHz to VNG, to put it into the right part of the radio frequency spectrum. To have the old frequencies re-allocated would require alteration of the Spectrum Management Plan. This would take about 12 months. This option will probably be pursued but, to get VNG back on the air quickly, it decided to accept 5.0, 10.0 and 15.0 MHz as an interim measure.

The problems continue

There was a very negative reaction to the new frequencies from users with overseas interests because of the number of other frequency and time signal services on the same frequencies. For this reason we delayed applying for the licences.

VNG was granted a temporary licence to transmit for a few hours on 4.5 MHz on the nights of 21-22 August and 21-22 October so that astronomers could time grazing occultations. Aside from that it remained dormant and we seemed to be in an impass.

Finally, the VNG Users Consortium met in October and decided that the licences on the new frequencies should be paid, but that it should go on the air initially only on 5.0 MHz to cause minimum disruption on those crowded channels. Accordingly,

this was done, but then Radio Frequency Licensing found that the International Radio Regulations require international approval of a frequency change. Consequently our decision to go on air continuously on 5.0 MHz from 1 November was stymied.

DOTC granted a temporary licence for 5.0 MHz from 7—18 November so that VNG could be used as a back-up to Omega during annual station maintenance.

The new voice announcement was done by WIA member, Graham Conolly VK2BL, a Sydney ABC news reader prior to his retirement. He recorded it free of charge in the Brisbane studios of the ABC while on holiday at Expo. Aren't we VNG supporters a dedicated lot! Reception of Graham's pleasant tones has been reported from as far afield as India and USA.

Technical problems were experienced during this transmission. The aerial used for the 4.5 MHz transmission was a Wells Quadrant which resonated very close to that frequency resulting in a good voltage standing wave ratio (VSWR) of 1.5:1 and enabling VNG to go on the air at the full 10 kW power. The two Wells quadrant aerials usable for 5.0 MHz transmission are actually designed for the frequency ranges 2-5 and 5-10 MHz respectively. In each case, 5.0 MHz was right at the limit of their capabilities, resulting in high standing wave ratios and serious overheating of the transmitter on 10 kW. This resulted in transmitter failure on 11 November. After repair of the transmitter and temporary stubbing of the 5-10 MHz aerial, VNG was put to air on 11 November at 6 kW with an overall VSWR of 2.4:1.

The signal generation equipment

The heart of VNG is three small racks of electronics: precision quartz oscillators (controlled by a two-tone signal generated from caesium beam primary standards at Telecom Australia Research Laboratories), time signal generators, fixed frequency synthesisers, announcing machines, supervisory equipment, DUT1 code generators, civil time receivers, and power supplies. A rubidium standard is being used instead of the oscillators until Telecom installs the connection to the two-tone. The slow time code also awaits the installation of a private line.

The transmitters

The VNG transmitters are STC HF broadcast transmitters, designed to deliver an output of 10 kW carrier power over the frequency range 3.2-28.0 MHz. Except for the HT transformer mounted externally, the equipment is a self contained two unit cabinet.

When the full VNG service is running, one transmitter will be left tuned to each of the three frequencies; the fourth transmitter will be used as a standby. At present, one transmitter is tuned to 4.5 MHz, another to 5.0 MHz, a third is operational and the fourth needs a lot of work. The transmitters are quick and easy to re-tune.

The present situation

As of the time of writing (February 1989) VNG is transmitting on 5.0 MHz on a three months temporary licence which commenced on 8 December 1988. The aerial used initially was an omnidirectional monopole with a good VSWR of 1.4:1, so transmission took place at the full 10 kW power. However, complaints were received from people living near the transmitters that VNG was interfering with their videos. Although DOTC advised that the 5.0 MHz transmission fulfilled its requirements and was within the law, on 13 January 1989 it was decided to cease using the vertical aerial, because of the strong surface wave, and experiment with horizontal ones. At present, VNG is being transmitted using 5 kW power and a Wells quadrant aerial with a VSWR of 2.5:1. This is not causing video interference. An attempt will be made to tune the Wells quadrant aerial in the near future.

Permanent continuous transmissions will start as soon as approval is received from the International Frequency Registration Board.

We will be pleased to receive reception reports on the current VNG broadcast, and also expressions of support because, even with Government funding, a certain percentage of cost recovery will be required from users.

References

VNG, Standard Frequency and Time Signal Service, Lyndhurst, Victoria by R W Harris, Telecom Research Laboratories, Clayton, Victoria.

STC HF BROADCAST TRANSMITTER HANDBOOK

Interference investigating Charge

The Federal Government's cost recovery policy for the public sector will see DOTC making a charge for investigating interference to radio and rtelevision broadcast reception.

DOTC investigates 20,000 interference complaints a year. The Professional Radio and Electronics Institute of Australia — which representsDOTC field personnel who investigate interference complaints — believes a $50 charge is likely to be imposed.

AIRCRAFT ENHANCEMENT

Another view

Ian Cowan VK1BG
13 Mainoru Place, Hawker,
ACT. 2614

For some years now, VHF amateurs in Sydney, Canberra and Melbourne, and more recently elsewhere, have been making regular use of the Aircraft Enhancement (AE) mode of propagation of VHF signals to establish contact on 144 and 432 MHz.

Results have usually been good, and sometimes even spectacular, with, for example, 5 x 9 signals being exchanged between Melbourne and Canberra on 432 MHz.

There have been several articles in this magazine in recent years about this mode of propagation. The most notable have been by Doug McArthur VK3UM (who was the first to exploit this mode regularly), Gordon McDonald VK2ZAB, and Roger Harrison VK2ZTB. These articles are more fully indexed in the reference list below. In addition, VK2ZAB and the writer engaged in personal correspondence over a period of some months between May and September 1987. As readers of his contributions to AR on this subject will know, Gordon has very firm views regarding the mechanism responsible for the AE mode of propagation. I found the exchanges with him to be forthright, but otherwise very helpful to my developing an understanding of how it works.

None of the above authors offers a full explanation of the AE mode as I have observed it from my VK1 QTH. Gordon's calculations didn't fit and Roger's backward moving footprint didn't work either. As a result of my own observations and of my dialogue with VK2ZAB, I have concluded that, although there is likely to be a good deal of truth in the explanation provided by him concerning metallic reflection, there is also a mode of hot gas supported propagation which gives very good results indeed when the conditions are right. A favourable set of conditions would comprise:

(a) A baseline distance of, say, 450 kilometres (eg VK1 to Melbourne).

(b) Air reasonably still and stable (ie pilots do not report turbulence or strong winds).

(c) Ground-wave propagation is normal - big temperature inversions are unhelpful to AE, although they may be a blessing in other ways.

(d) The aircraft track is nearly parallel to the radio wave path, and the intersection of the two is close to the mid-point of the radio path.

(e) Both stations have line of sight to the aircraft.

(f) Both stations have sideband equipment; better than 20 watts transmitter power, reasonable antenna gain, and low noise receiver preamplifiers. It can work on FM, but the average FM operator lacks the necessary ERP and receiver sensitivity.

What does an aircraft do??

There are two important characteristics of the wake left behind an aircraft which make it potentially a very good refractor of VHF signals. Firstly, the aircraft delivers a large amount of heat to the atmosphere which creates a temperature anomaly, and second, the geometric shape of its wake is very like a two dimensional copy of the temperature inversions produced in nature which provide so much fun for serious VHF operators. Each of these properties will be considered in detail below.

Aircraft heat delivery

The following discussion makes use of a number of different information sources. In the text these are referred to by the surname of the source, except that WBE is used in lieu of World Book Encyclopaedia. A complete list of references is given at the end of this article.

The mixing of imperial and metric units is done for the sake of simplicity, given the variety of the source material.

Probert advises that the fuel consumption of a B747 aircraft in level flight, at cruising speed and at 35,000 feet, is between 0.016 nautical miles per pound (fully loaded) and 0.016 nautical miles per pound (fully loaded) and 0.026 nautical miles per pound (lightly loaded). A typical value could reasonably be taken as 0.02 nautical

miles per pound. This corresponds to 50 pounds per nautical mile.

50lb/NM = 50/1.852 lb/km, ie 26/lb/km

Now the cruising speed of a B747 is about 870 kilometres per hour, or 14.5 kilometres per minute. Thus the fuel consumption of the aircraft is about 27 x 14.5 pounds per minute, which equals 391.5 pounds per minute. Since the aircraft is in the level cruise equilibrium mode, all the heat of combustion of this fuel is released to the atmosphere, where it causes a temperature rise.

From Low, the lower calorific value of kerosene is 10,200 CHU/lb. Thus the heat liberated by the combustion of 391.5 pounds of fuel each minute by the aircraft is 391.5 x 10200 CHU, ie 3,990,000 CHU/minute. For those unfamiliar with these units, this corresponds to about 126 megawatts. Note that no vapour condensation is allowed for in this case. (Should condensation occur, the heat liberation would be greater, since the latent heat of vapourisation would then also be released.).

Atmospheric Heating

From WBE, the air pressure at 35,000 feet is about 3.45 PSI. The air temperature at this height varies quite a bit but -35 degrees Celsius (238 degrees Kelvin) may be taken as a typical value.

Low (p25) gives the volume of one pound of air at 14.7 PSI and 0 degrees Celsius (273 degrees Kelvin) as 12.39 cubic feet.

Using the universal gas law P1.V1/T1 = P2.V2/T2,

V2 = 14.7 x 12.39/273 x 238/3.45

= 46.02 cubic feet or 1.303 cubic metres.

That is, one pound of air at 35 000 feet and at -35 degrees Celsius, occupies approximately 1.303 cubic metres.

Low shows that the specific heat of air at constant pressure (Kp) may be calculated from:

Kp = 0.230 + 0.000038.t

where t is the temperature in degrees Celsius.

Thus at -35 degrees Celsius,

Kp = 0.230 - 0.00133

= 0.2287

Now it is possible to calculate the amount of air heated by a given amount per minute by the passage of the above B747. Let us work it out for, say, a 10 degree Celsius rise.

Weight of air so heated = CHU/Kp x 1/10

= 3,990,000/0.2287 x 1/10

= 1, 745, 000 pounds

The volume of this air at 35,000 feet is 1,745,000 x 46.02 cubic feet. That is 80 300 000 cubic feet. This equals 2, 274, 000 cubic metres of hot (10 degrees Celsius rise) air generated for each minute of passage of the aircraft.

Now, if the aircraft was producing a uniformly heated volume of air at 10 degrees Celsius temperature rise, and its speed is 14,500 m/minute, then the cross sectional area of the volume so produced (as seen from the tail of the aircraft) must be 2,274,000/14,500 square metres, ie 157 square metres.

As it happens, the aircraft is not producing a uniformly heated volume of air; obviously the efflux is hotter close to the aircraft than it is further away. However, there will be some point behind our B747 at which the efflux is 10 degrees Celsius above ambient, and the cross sectional area of the warm air at this point will be 157 square metres. The shape of this cross section can only be guessed at. However, given the geometry of the aircraft, the cross section will be rather wider than it is high.

Radio refractive index (RRI)

Jessop provides a detailed explanation of the refraction of radio waves in the atmosphere. The RRI is defined in terms of "N" units. It is stated that where a layer is encountered in the atmosphere in which the RRI falls at a rate greater than 157 N units per kilometre of increasing height then radio signals from Earth will be refracted sufficiently to return to Earth.

Jessop shows that the maximum water vapour pressure at -35 degrees Celsius is 0.3 mb (dew point). Now at -25 degrees Celsius (the temperature of the air heated by the aircraft as assumed for convenience in the above example) the saturation vapour pressure would be 0.8 mb, but this cannot apply in practice, since in our case we are not dealing with a closed system. Thus the water vapour pressure in the aircraft efflux is constrained by that of the general environment, ie 0.3 mb. This interesting anomaly is a consequence of Dalton's Law.

We have already seen that the air pressure at 35,000 feet is about 3.45 PSI. This corresponds to 117 mb.

From Jessop, the RRI of air is given by:

RRI = 77.6 x p/T + 373,300 x e x 1/Tsquared N units

where p = atmospheric pressure in mb

e = water vapour pressure in mb

T = air temperature in degrees Kelvin.

At 35,000 feet and - 35 degrees Celsius, (ie ambient conditions).

RRI = 77.6 x 1117/238 + 373,300 x 0.3 x 1/238 x 1/238

= 40.13 N units.

The RRI of air in this region which has been heated 10 degrees Celsius above ambient by the passage of our B747 will be

RRI = 77.6 x 117/248 + 373,300 x 0.3 x 1/248 x 1/248 = 38.43 N units.

The RRI of the heated air is therefore 1.70 N units lower than that of the unheated air immediately below it. Provided the vertical thickness of the heated layer is less than about 11 metres, (as seems very probable, since the warm air mass must significantly be wider than it is high) the RRI gradient will exceed the -157 N unit per kilometre which Jessop says is necessary to return a radio wave to Earth.

All this shows that radio refraction sufficient for our purposes can at least occur from an air mass which exists somewhere between the 10 degrees Celsius point and the aircraft. It will also work for lesser temperature rises than 10 degrees Celsius, but I have not attempted to work out what the critical temperature might be, if indeed there is one.

The distance behind the aircraft at which the efflux has cooled to just 10 degrees Celsius above ambient is not known. However, it has been reported that work done by the RAAF some years ago showed that the thermal footprint of an aircraft is easily detectable 20 kilometres behind the aircraft.

The above demonstrates that there is adequate heat generated by the passage of a sizable aircraft to be potentially useful for radio propagation purposes. However, having a suitable sharp rate of change of RRI is only part of the story - the RRI gradient must have the right topology.

Aircraft wake geometry

In his AR article, Roger Harrison drew attention to an item in the Aviation Safety Digest issue 121 (ASD) about the wake turbulence of aircraft. From this it appears that an aircraft in transit leaves behind it contra rotating vortices generated by the action of the wings; these are quite intense, and retain their form and physical dimensions for a considerable distance behind the aircraft. The vortices trap the heated efflux from the aircraft, and inhibit, rather than encourage, its dispersal.

Meanwhile, the wings of the aircraft act as a single blade of a very large fan which thrusts air downwards as the aircraft passes. It is by this means that the aircraft derives its lift. It appears from the above issue of the ASD that the wash from an aircraft typically sinks some 900 feet before stabilising, and that it reaches this level about 1.5 minutes after the aircraft passes. By the time the efflux has reached this sink level, therefore, the aircraft has moved forward by over 20 kilometres. Thus the efflux of hot air from the aircraft is V

shaped, the front half of the V (closest to the aircraft) being the sink resulting from wing action, and the rise thereafter being due to convection. Figure 1 shows this in diagrammatic form.

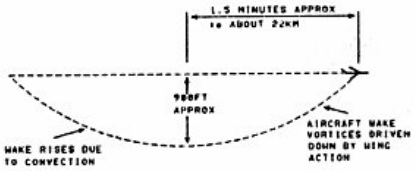


Figure 1.

What the aircraft is doing is dragging a kind of shallow, open, inverted two dimensional prism behind it, with the prism having a lower refractive index that the surrounding air. It therefore behaves in a reverse manner to that of the glass prism of our physics text books. It is instructive to do some wave tracing on some diagrams to illustrate the situation. Figure 2 shows how a ray of light behaves when passing through a prism having a refractive index higher than that of its surroundings. This is an inverted version of the diagram found in high school physics texts. As can be seen, the light ray is refracted upwards toward the base of the prism. Useless for our purposes. Figure 3 shows the situation when the refractive index of the prism is lower than that of its surroundings. In this case the wave front is refracted downwards. This is the situation created by the efflux of an aircraft. The efflux has an RRI less than that of its surroundings, and at its apex it has the form of an inverted prism.

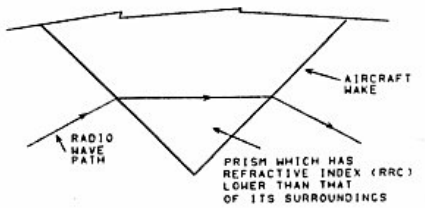


Figure 2.

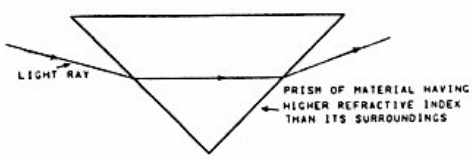


Figure 3.

The diagrams in Jessop's text show the distribution of -RRI gradients for a number of good, naturally occurring openings around Europe. Naturally occurring temperature inversions which are of use to amateurs seem to have the shape of large, broad, inverted cones, and appear to behave in a similar manner to that of the aircraft generated prism. The similarity of their cross-sectional topology is striking. Since they are roughly conical in form, naturally occurring inversions can be used over a relatively wide range of azimuth angles, whereas the aircraft generated prism, because it has two dimensional form only, proves to be quite directional in conferring its benefits.

Thus stations wishing to use this mode of propagation must be sited so that the line between them is closely parallel to, and underneath, the aircraft track.

CONCLUSION

It is shown above that a large aircraft is a heat generator of sufficient magnitude to create a temperature inversion at high altitudes and, as a result, is capable of causing significant refraction of radio waves.

The form of this inversion is such as to return the signals to Earth at a significantly distant point from the transmitter. From my investigations as explained in this article, metallic reflection from the aircraft skin is not the only mode of aircraft assisted propagation as VK2ZAB maintains. It also shows that there will be no need to put away our VHF equipment when non-metallic aircraft take to the skies.

REFERENCES

Articles on this subject in this magazine as follows:

MCARTHUR, D, VK3UM. July 1985

McDONALD, G.J., VK2ZAB. October 1985

HARRISON, R, VK2ZTB. November 1985

McDONALD, G.J, VK2ZAB. February 1986.

MARTIN & CONNOR. Basic Physics, Volume 1, 7th Edition.

LOW, D.A, Heat Engines

JESSOP. VHF/UHF Manual. 4th Edition.

World Book Encyclopaedia (WBE), 1977 Edition.

PROBERT, N. Principal Engineer, Flight Performance Section, Department of Aviation. Personal Communication. July 8, 1987.

Metric Practice. Metric Conversion Board, 1973.

Aviation Safety Digest No 121; Department of Aviation Australia, 1985.

Lloyd Butler VK5BR
Ottawa Ave
Panorama 5041

BASIC THEORY

Introduction to the Superheterodyne receiver

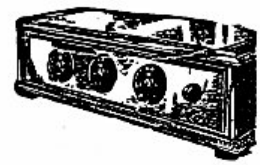


Figure 2: Separate Dials for each Tuned Stage.

Radio receivers have developed considerably over the years around a principle first evolved in 1918.

Following is a discussion on the principle of the superheterodyne and factors which affect its design.

Introduction

The subject of this article centres around basic principles of the superheterodyne receiver . In the article we will discuss the reasons for the use of the superheterodyne and various topics which concern its design, such as the choice of intermediate frequency., the use of its RF stage, oscillator tracking, bandspread tuning and frequency synthesis. Most of the information is standard text book material, but put together as an introductory article, it can provide somewhere to start if you are contemplating building a receiver, or if you are considering examining specifications with an objective to select a receiver for purchase.

TRF Receivers

Early valve radio receivers were of the Tuned Radio Frequency (TRF) type consisting of one or a number of tuned radio frequency stages with individual tuned circuits which provided the selectivity to separate one received signal from the others. A typical receiver

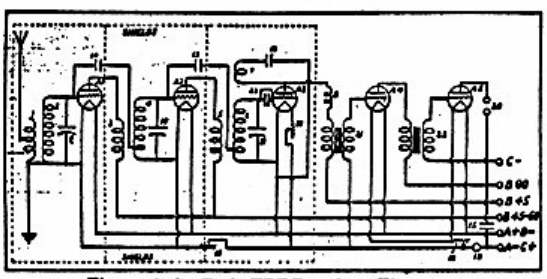


Figure 1: An Early TRF Receiver. The theoretical circuit shows that there are two stages of neutralised RF, and regenerative detector in the receiver while the audio stages are transformer coupled.
—from *The Listener In*, July 31, 1929

copied from a 1929 issue of The Listener In is shown in Figure 1. Tuned circuits are separated by the radio frequency (RF) amplifier stages and the last tuned circuit feeds the AM detector stage. This receiver belongs to an era before the introduction of the screen grid valve and it is interesting to observe the grid-plate capacity neutralisation applied to the triode RF amplifiers to maintain amplifier stability. In these early receivers, the individual tuning capacitors were attached to separate tuning dials, as shown in Figure 2, and each of these dials had to be reset each time a different station was selected. Designs evolved for receivers with only one tuning dial, achieved by various methods of ganging the tuning capacitors, including the ganged multiple tuning capacitor with a common rotor shaft as used today.

The bandwidth of a tuned circuit of given Q is directly proportional to its operational frequency and hence, as higher and higher operating frequencies came into use, it became more difficult to achieve sufficient selectivity using the TRF receiver system.

The superheterodyne principle

The superheterodyne (short for supersonic heterodyne) receiver was first evolved by Major Edwin Howard Armstrong, in 1918. It was introduced to the market place in the late 1920s and

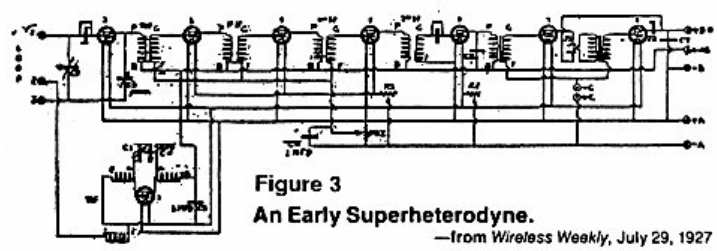


Figure 3
An Early Superheterodyne.
—from *Wireless Weekly*, July 29, 1927

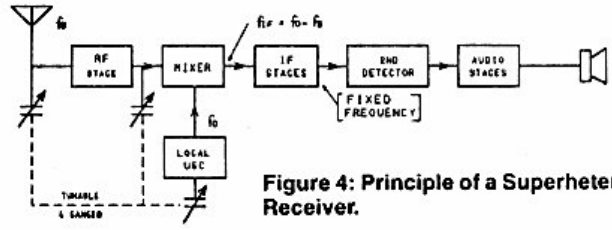


Figure 4: Principle of a Superheterodyne Receiver.

gradually phased out the TRF receiver during the 1930s. The circuit of an early superheterodyne, as published in a 1927 issue of Wireless Weekly, is shown in Figure 3.

The principle of operation in the superheterodyne is illustrated by the diagram in Figure 4. In this system, the incoming signal is mixed with a local oscillator to produce sum and difference frequency components. The lower frequency difference component called the intermediate frequency (IF), is separated from the other components by fixed tuned amplifier stages set to the intermediate frequency. The tuning of the local oscillator is mechanically ganged to the tuning of the signal circuit or radio frequency (RF) stages so that the difference intermediate frequency is always the same fixed value. Detection takes place at intermediate frequency instead of at radio frequency as in the TRF receiver.

Use of the fixed lower IF channel gives the following advantages.

1. For a given Q factor in the tuned circuits, the bandwidth is lower making it easier to achieve the required selectivity.

2. At lower frequencies, circuit losses are often lower allowing higher Q factors to be achieved and hence, even greater selectiv-

ity and higher gain in the tuned circuits.

3. It is easier to control, or shape, the bandwidth characteristic at one fixed frequency. Filters can be easily designed with a desired bandpass characteristic and slope characteristic, an impossible task for circuits which tune over a range of frequencies.

4. Since the receiver selectivity and most of the receiver pre-detection gain, are both controlled by the fixed IF stages, the selectivity and gain of the superheterodyne receiver are more consistent over its tuning range than in the TRF receiver.

Second channel or image frequency

One problem, which has to be contended with in the superheterodyne receiver, is its ability to pick up a second or image frequency removed from the signal frequency by a value equal to twice the intermediate frequency.

To illustrate the point, refer to Figure 5. In this example, we have a signal frequency of 1 MHz which mix to produce an IF of 455 kHz.

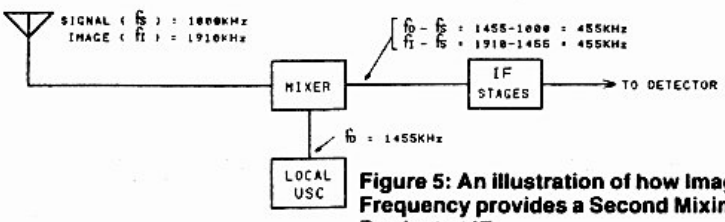


Figure 5: An illustration of how Image Frequency provides a Second Mixing Product at IF.

A second or image signal, with a frequency equal to 1 MHz plus (2 x 455) kHz or 1.910 MHz, can also mix with the 1.455 MHz to produce the 455 kHz.

Reception of an image signal is obviously undesirable and a function of the RF tuned circuits, ahead of the mixer, is to provide sufficient selectivity to reduce the image sensitivity of the receiver to tolerable levels.

Choice of intermediate frequency

Choosing a suitable intermediate frequency is a matter of compromise. The lower the IF used, the easier it is to achieve a narrow bandwidth to obtain good selectivity in the receiver and the greaater the IF stage gain. On the other hand, the higher the IF, the further removed is the image frequency from the signal frequency and hence the better the image rejection. The choice of IF is also affected by the selectivity of the RF end of the receiver. If the receiver has a number of RF stages, it is better able to reject an image signal close to the signal frequency and hence a lower IF channel can be tolerated.

Another factor to be considered is the maximum operating frequency of the receiver. Assuming Q to be reasonably constant, bandwidth of a tuned circuit is directly proportional to its resonant frequency and hence, the receiver has its widest RF bandwidth and poorest image rejection at the highest frequency end of its tuning range.

A number of further factors influence the choice of the intermediate frequency.

1. The frequency should be free from radio interference. Standard intermediate frequencies have been established and these are kept clear of signal channel allocation. If possible, one of these standard frequencies should be used.

2. An intermediate frequency which is close to some part of the tuning range of the receiver is avoided as this leads to instability when the receiver is tuned near the frequency of the IF channel.

3. Ideally, low order harmonics of the intermediate frequency (particularly second and third order) should not fall within the tuning range of the receiver. This requirement cannot always be achieved resulting in possible heterodyne whistles at certain spots within the tuning range.

4. Sometimes, quite a high intermediate frequency is chosen because the channel must pass very wide band signals such as those modulated by 5 MHz video used in television. In this case, the wide bandwidth circuits are difficult to achieve unless quite high frequencies are used.

5. For reasons outlinedpreviously, the intermediate frequency is normally lower than the RF or signal frequency. However, there are some applications, such as in tuning the Low Frequency (LF) band, where this situation could be reversed. In this case there are difficulties in making the local oscillator track with the signal circuits.

Some modern continuous coverage HF receivers make use of the Wadley Loop or a synthesised VFO to achieve a stable first oscillator source and these have a first intermediate frequency above the highest signal frequency. The reasons for this will be discussed later.

Standard intermediate frequencies

Various intermediate frequencies have been standardised over the years. In the early days of the superheterodyne, 175 kHz was used for broadcast receivers in the USA and Austrlia. These receivers were notorious for their heterodyne whistles caused by images of broadcast stations other than the one tuned. The 175 kHz IF was soon overtaken by a 465 kHz allocation which gave better image response. Another compromise of 262kHz between 175 and 465 wal also used to a lesser extent. The 465 kHz was eventually changed to 455 kHz, still in use today.

In Europe, long wave broadcasting took place within the band of 150 to 350 kHz and a more suitable IF of 110 kHz was utilised for this band.

The IF of 455 kHz is standard for broadcast receivers including many communication receivers. Generally speaking, it leads to poor image response when used above 10 MHz. The widely used World War II Kingsley AR7 receiver used an IF of 455 kHz but it also utilised two RF stages to achieve improved RF selectivity and better image response. One commonly used IF for shortwave receivers is 1.600 MHz and this gives a much improved image response for the HF spectrum.

Amateur band SSB HF transceivers have commonly used 9 MHz as a receiver intermediate frequency in common with its use as a transmitter intermediate frequency. This frequency is a little high for ordinary tuned circuits to achieve the narrow bandwidth needed in speech communication, however, the bandwidth in the amateur transceivers is controlled by specially designed ceramic crystal filter networks in the IF channel.

Some recent amateur transceivers use intermediate frequencies slightly below 9 MHz. A frequency of 8.830 MHz can be found in various Kenwood transceivers and a frequency of 8.987.5 MHz in some Yaesu transceivers. This change could possibly be to avoid the second harmonic of the IF falling too near the edge of the more recently allocated 18 MHz WARC band. (The edge of the band is 18.068 MHz).

General coverage receivers using the Wadley Loop, or a synthesised bandset VFO, commonly use first IF channels in the region of 40 to 50 MHz.

An IF standard for VHF FM broadcast receivers is 10.700 MHz. In this case, the FM deviation used is 75 kHz and audio range is 15 kHz. The higher IF is very suitable as the wide bandwidth is easily obtained with good image rejection. A less common IF is 4.300 MHz believed to have been used in receivers tuning the lower end of the VHF spectrum.

As explained earlier, a very high intermediate frequency is

necessary to achieve the wide bandwidth needed for television and the standard in Australia is the frequency segment of 30.500 to 36.000 MHz.

Multiple Conversion Superheterodyne

In receivers tuning the upper HF and the VHF bands, two (or even more) IF channels are commonly used with two (or more)

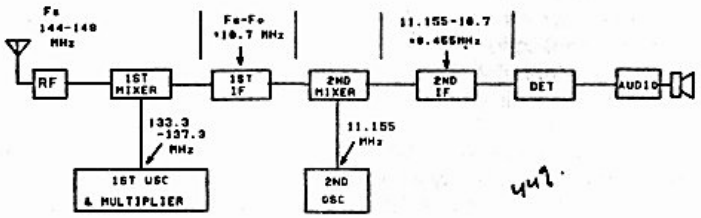


Figure 6: A Two-Metre Receiver using Double Conversion.

stages of frequency conversion. The lowest frequency IF channel provides the selectivity or bandwidth control that is needed and the highest frequency IF channel is used to achieve good image rejection. A typical system used in two metre FM amateur transceivers is shown in Figure 6 in which IF channels of 10.700 MHz and 455 kHz are used in a double conversion system. The requirement is different to that of the wideband FM broadcasting system as frequency deviation is only 5 kHz with audio frequencies up to 2.5 kHz. Channel spacing is 25 kHz and bandwidth is usually limited to less than 15 kHz so that the narrower bandwidth 455 kHz IF channel is needed.

Some modern HF SSB transceivers use a very high frequency IF channel such as 50 MHz. Combined with this, a last IF chaannel of 455 kHz is used to provide selectivity and bandwidth control. Where there is such a large difference between the first and last intermediate frequency, three stages of conversion and a middle frequency IF channel are needed. This is necessary to prevent an image problem initiating in the 50 MHz IF channel due to insufficient selectivity in that channel. For satisfactory operation, the writer suggests a rule of thumb that the frequency ratio between the RF channel and the first IF channel, or between subsequent IF channels, should not exceed a value of 10.

The RF amplifier

A good receiver has at least one tuned RF amplifier stage ahead of the first mixer. As discussed earlier, one function of the RF stage is to reduce the image frequency level into the mixer. The RF stage also carries out a number of other useful functions.

1. The noise figure of a receiver is essentially determined by the noise generated in the first stage connected to the aerial system. Mixer stages are inherently more noisy than straight amplifiers and a function of the RF amplifier is to raise the signal level into the mixer so that the signal to noise ratio is determined by the RF amplifier characteristics rather than those of the mixer.

2. There is generally an optimum signal input level for mixer stages. If the signal level is increased beyond this optimum point, the levels of intermodulation products steeply increase and these products can cause undesirable effects in the receiver performance. If the signal level is too low, the signal to noise ratio will be poor. A function of the RF amplifier is to regulate the signal level iinto the mixer to maintain a more constant, near optimum, level. To achieve this regulation, the gain of the RF stage is controlled by an automatic gain control system, or a manual gain control system, or both.

3. Because of its non-linear characteristic, the mixer is more prone to cross-modulation from a strong signal on a different frequency than is the RF amplifier. The RF tuned circuits, ahead of the mixer, help to reduce the level of the unwanted signal into the mixer input and hence reduce the susceptibility of the mixer to cross-modulation.

4. If, by chance, a signal exists at or near the IF, the RF tuned circuits provide attenuation to that signal.

5. The RF stage provides isolation to prevent signals from the local oscillator reaching the aerial and causing interference by being radiated.

Oscillator tracking

Whilst the local oscillator circuit tunes over a change in frequency equal to that of the RF circuits, the actual frequency is normally higher to produce the IF frequency difference component and hence less tuning capacity change is needed than in the RF

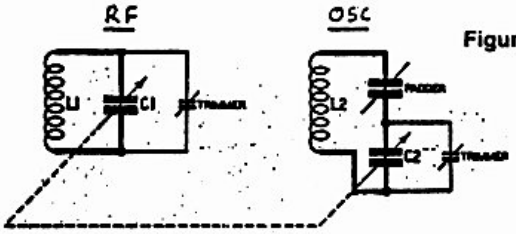


Figure 7: Tracking Circuit.

tuned circuits. Where a variable tuning gang capacitor has sections of the same capacitance range used for both RF and oscillator tuning, tracking of the oscillator and RF tuned circuits is achieved by capacitive trimming and padding.

Figure 7 shows a local oscillator tuned circuit (L2,C2) ganged to an RF tuned circuit (L1,C1) with C1 and C2 on a common rotor shaft. The values of inductance are set so that at the centre of the tuning range, the oscillator circuit tunes to a frequency equal to RF or signal frequency plus intermediate frequency.

A capacitor called a padder, in series with the oscillator tuned circuit, reduces the maximum capacity in that tuning section so that the circuit tracks with the RF section near the low frequency end of the band.

Small trimming capacitors are connected across both the RF and oscillator tuned circuits to adjust the minimum tuning capac-

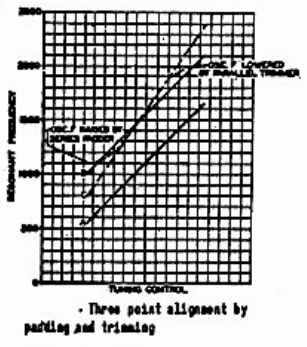


Figure 8: RF and Oscillator Tracking.

ity and affect the high frequency end of the band. The oscillator trimmer is preset with a little more capacity than the RF trimmer so that the oscillator circuit tracks with RF trimmer near the high frequency end of the band.

Figure 8 illustrates the principle. Curve A is the RF tuning range. The solid curve B shows the ideal tuning range required for the oscillator with a constant difference frequency over the whole tuning range. Curve C shows what would happen if no padding or trimming were applied. Dotted curve B shows the correction applied by padding and trimming. Precise tracking is achieved at three points in the tuning range with a tolerable error between

these points.

Where more than one band is tuned, not only are separate inductors required for each band, but also separate trimming and padding capacitors, as the degree of capacitance change correction is different for each band.

The need for a padding capacitor can be eliminated on one band by using a tuning gang capacitor with a smaller number of plates in the oscillator section than in the RF sections. If tuning more than one band, the correct choice of capacitance for the oscillator section will not be the same for all bands and padding will still be required on other bands.

Alignment of the tuned circuits can be achieved by providing adjustable trimmers and padders. In these days of adjustable magnetic cores in the inductors, the padding capacitor is likely to be fixed with the lower frequency end of the band essentially set by the adjustable cores.

Oscillator Stability

The higher the input frequency of a receiver, the higher is the first local oscillator frequency and the greater is the need for oscillator stability. A given percentage frequency drift at higher frequencies amounts to a larger percentage drift in IF at the detector. Good stability is particularly important in a single sideband receiver as a small change in signal frequency is very noticeable as a change in the speech quality, more so than would be noticeable in AM or FM systems.

Frequency stability in an osicillator can be improved by care in the way it is designed and built. Some good notes on how to build a stable variable frequency oscillator were prepared by Drew Diamond VK3XU, and published in Amateur Radio, January 19988. This is an article well worth reading.

One way to stabilise a receiver tunable oscillator is to use an automatic frequency control (AFC) system. To do this, a frequency discriminator can be operated from the last IF stage and its output fed back via a low pass filter (or long time constant circuit) to a frequency sensitive element in the oscillator. Many of today's receivers and transceivers also make use of phase locked loop techniques to achieve frequency control.

Where there are several stages of frequency conversion and the front end is tuned, the following oscillator stages, associated with later stage of conversion, are usually fixed in frequency and can be made stable by quartz crystal control. In this case, receiver

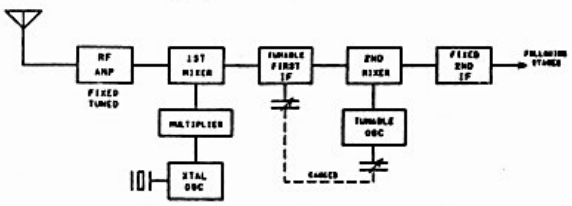


Figure 9: Tuning at the First IF and Second Heterodyne Oscillator Level.

frequency stability is set by the first oscillator stability.

One arrangement, which can give better stability, is to crystal lock the first oscillator stage but tune the first IF stage and second oscillator stage as shown in Figure 9. In this case, the RF tuned circuits are sufficiently broadband to cover a limited tuning range (such as an amateur band) but selective enough to attenuate the image frequency and other possible unwanted signals outside the tuning range. This is the method used when a converter is added to the front end of a HF receiver to tune say the two metre band. The RF circuits in the converter are fixed, the converter oscillator is crystal locked and the HF receiver RF and first oscillator circuits become the tunable first IF stage and second tunable oscillator, respectively. Since the HF receiver tunable oscillator is working at a lower frequency than the first oscillator in the converter, the whole system is inherently more stable than if the converter oscillator were tuned.

As stated earlier, the system is restricted to a limited tuning range and this leads to a discussion on bandspread tuning and other systems incorporating such ideas as the Wadley Loop.

Bandspread tuning

Receivers which tune over a wide frequency range as one band generally requires some form of fine tuning or bandspread tuning to enable easy resolution of the signals. A simple way to do this is to use two tuning gangs connected in parallel, one large to cover the whole range and which can be set at fixed bandset points, and one small which provides bandspread tuning around the bandset frequency. The difficulty with the system is in accurately positioning the bandset points. A 100 kHz marker harmonic generator is an essential part of such a receiving system to inject marker signals, at 100 kHz intervals, which provide calibration to set the bandset control accurately.

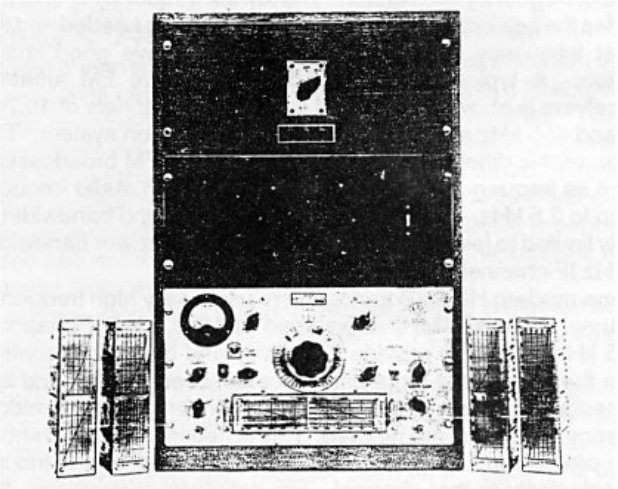


Figure 10: The Kingsley AR7 Receiver.

Many earlier communications receivers, such as the National HRO and Kingsley AR7 (Figure 10) used mechanical bandspread. In these receivers, the tuning capacitors are driven via a high ratio geared dial, quoted as having a range of 500 degrees over an equivalent length of 12 feet.

As discussed earlier, bandspread tuning can be applied with better frequency stability by tuning an IF stage, provided that the source of local signal injected into the first mixer can be frequency stabilised. For the general frequency coverage receiver, the injected source needs to be tuned or preset at fixed frequencies over a wide frequency range. It also needs to be able to be preset accurately and once set, it should maintain frequency stability. These requirements can be achieved with a system incorporating what is called the Wadley Loop which will be discussed in the next paragraph. They can also be achieved by using a frequency synthesis system to be discussed later.

The Wadley Loop

The Wadley Loop is a system used in HF receivers such as the Racal RA17 and the Yaesu FRG-7. (Figure 11). This system provides bandspread tuning in a lower frequency IF stage combined with a stable and accurate bandsetting arrangement which covers the wide tuning range of 1 to 30 MHz.

The RF stage of this type of receiver is fixed tuned and broadbanded to cover the full 1 to 30 MHz. A very high first oscillator frequency with a very high first intermediate frequency is

Figure 11: The Yaesu FRG-7 Receiver.

used to place the image frequency always well outside the RF passband. In the FRG-7, the first oscillator VFO is tunable between 55.500 and 84.500 MHz and the first IF channel is broadbanded over a frequency range of 54.500 to 55.500 MHz.

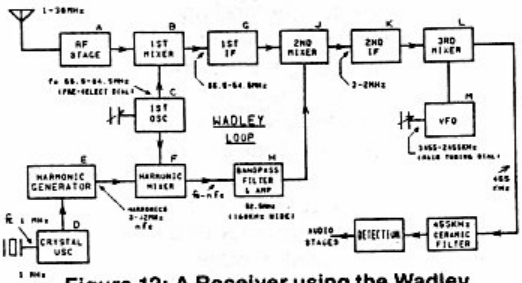


Figure 12: A Receiver using the Wadley Loop.

Referring to the block diagram, Figure 12, which is based on the FRG-7, the front end stability is controlled by a 1 MHz crystal oscillator D which drives a harmonic generator E. Harmonics of 1 MHz, within the range of 3 to 32 MHz, are fed to the harmonic mixer F and mixed with the signal from the variable first oscillator C.

The first oscillator is the bandsetting stage and this is preset by the operator to any 1 MHz increment within the 55.500 to 84.500 MHz range with a tolerance of plus or minus 80 kHz of the increment point. Beat components between this oscillator frequency and the harmonic frequencies of the 1 MHz oscillator are produced at the output of mixer F, however, only one of these can pass through the bandpass filter H which has a centre frequency of 52.500 MHz with a bandwidth of 160 kHz.

The first oscillator is also mixed with the incoming signals at B to produce a first intermediate frequency within the 55.500 to 54.500 MHz bandwidth range of the IF channel.

The first intermediate frequency is then mixed at J with the output of the bandpass filter H to produce a difference output frequency tuned by second IF stage K, within the frequency range of 3 to 2 MHz. Note that the lowest frequency at the RF input A becomes the highest frequency at IF level K and vice versa.

In using such a high frequency tunable first oscillator C, one could expect frequency instability, however, in the process of double mixing at B and J, using components derived from the same oscillator source, any shift in the first oscillator frequency is cancelled out in the mixed IF output at K. Providing this oscillator is set so that the selected output product at F is within the 160 kHz tolerance of filter H, any given signal frequency at A produces the same IF signal frequency at K, independent of the actual frequency of the first oscillator C. The other frequency determining element, oscillator D, is crystal locked. In practice, the operator need only set the bandset control, coupled to oscillator C, approximately to the 1 MHz increment.

Bandspread tuning over a 1 MHz range is achieved by tuning variable frequency oscillator M, the output of which is mixed with the signal from the 3 to 2 MHz second IF channel to produce a third IF of 455 kHz. A 455 kHz ceramic filter in this IF channel then sets the signal bandwidth of the receiver. The 2 to 3 MHz IF stage must either be broadbanded over the 1 MHz range or tuned and ganged to the bandspread VFO tuning..

The Wadley Loop is a system which has been generally applied to receivers tuning the HF bands. Roger Harrison VK2ZTB, worked out a proposal for its use in the 30 to 100 MHz frequency region. This was published in Amateur Radio, December 1979, but at that stage the idea had not been put into practice.

Frequency Synthesis

Another method of frequency stabilising the bandset VFO is to make use of a phase locked loop (PLL) circuit with a crystal controlled reference oscillator. The VFO frequency is changed by voltage control and in the following discussion we will call it a voltage controlled oscillator (VCO). Figure 13 illlustrates the elements of this type of a circuit. In this circuit, the divided output (Fo/m) of the VCO is compared in a phase comparator with the

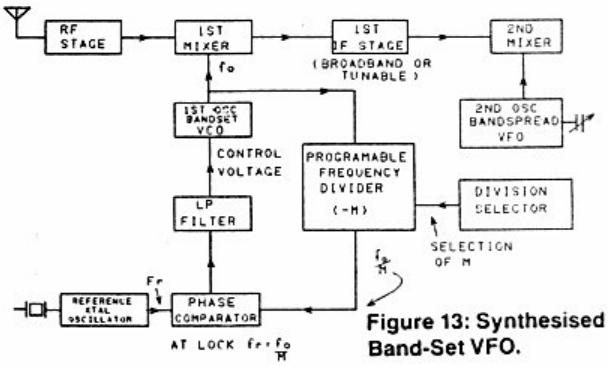


Figure 13: Synthesised Band-Set VFO.

output (Fr) of a crystal controlled stable oscillator. The phase comparator output is fed via a low pass filter to a frequency sensitive element in the VCO and this controls its frequency so that Fo/m equals Fr. The counter which does the dividing is programmable and its division ratio m is set by some form of control to control the VCO bandset frequency. The values of m are chosen to provide 1 MHz steps in the VCO frequency or whatever steps are desired for bandset spacing.

Bandspread is provided by fine tuning a VFO at a second stage of conversion, as described for the Wadley Loop receiver.

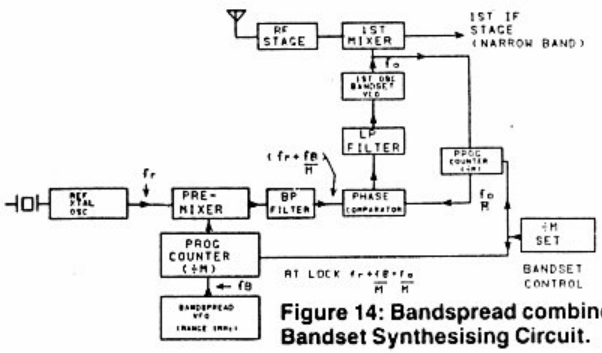


Figure 14: Bandspread combined with Bandset Synthesising Circuit.

An alternative method of providing the bandspread (refer Figure 14), is to insert an extra mixer stage into the reference oscillator circuit and inject bandspread VFO into the mixer. The reference signal into the phase comparator is then either the sum, or the difference, of the crystal controlled reference and the frequency of the bandspread VCO. For this operation, both bandset and bandspread oscillator outputs (Fo and Fb) are divided by the programmed value m and the bandset VCO is locked when (Fo/m) equals (Fr + Fb/m).

As in the previous system, the bandspread VCO tunes a low frequency range (such as 2 to 3 MHz) and is reasonably stable. An advantage of this second system is that a wideband or tunable following IF stage is not required.

Amateur Band Transceivers

Amateur radio operation in the HF region is limited to a number of bands of restricted frequency range and the bandset oscillator can be crystal controlled with crystals switched to change bands.

A system which has been used on various amateur single sideband transceivers, for a number of years, is shown in Figure 15. A single IF channel of 9 MHz is used with a ceramic crystal filter in that channel. The filter is used to limit the bandwidth of the receiver as well as being used as the sideband filter when the transceiver is switched to transmit. The local frequency source (Fo) to the mixer is generated by premixing a crystal bandset oscillator with a bandspread VFO covering the frequency range of 5 to 5.500 MHz. The frequency stability of the receiver is thus dependent on the stability of the bandspread VFO. It also determines the frequency stability of the transmitter, as on transmit, the whole system works in reverse by generating a 9 MHz SSB signal and beating it with the combined VFO source (Fo) to produce the transmit frequency. As the subject we are discussing is receivers, we will not elaborate further on the transmitter circuit.

The frequency mixing arrangement, as shown for different amateur bands in the table in Figure 15, utilises various combina-

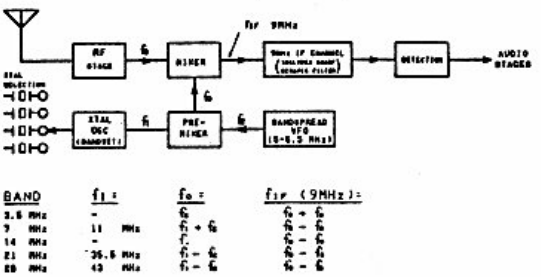
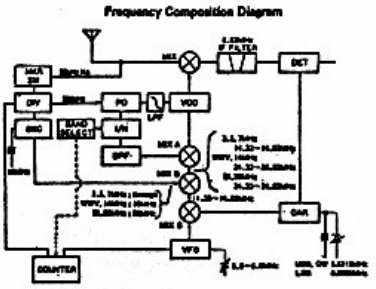


Figure 15: Receiving System in Amateur Band Transceiver using 9 MHz IF Channel.

tions of sums and differences in the two mixing operations. The arrangement, which is that used in the Yaesu FT-200 transceiver, is one example of how this type of receiving system is applied. Observe that, on the 3.5 and 14 MHz bands, only one mixing process is applied and the 5 to 5.5 MHz VFO (Fb) is directly mixed with the incoming signal (Fs).

More recent transceivers use the synthesised bandset system with the phase locked loop rather than individual selected crystals. Figure 16 shows the local signal generation system of the Kenwood TS-130. A 10 MHz crystal oscillator, divided down to 500 kHz, is the reference signal source for the phase detector. It is also divided down further to 25 kHz as a marker generator source.

The output of the voltage controlled oscillator (VCO), in the locked loop chain, is injected into the signal mixer at frequencies, for each of the amateur bands, as listed in the right hand table of Figure 14. The output of the signal mixer produces the intermediate frequency of 8.830 MHz. The slight deviation from the 9 MHz



HET FREQ(VCO)

BAND	FREQ(MHz)
3.5	12.33~12.83
7	15.83~16.33
10	18.83~19.33
14	22.83~23.33
18	26.83~27.33
21	29.83~30.33
24.5	33.33~33.83
28	36.83~37.33
28.5	37.33~37.83
29	37.83~38.33
29.5	38.33~38.83

Figure 16: Receiving System for the Kenwood TS-130.

of earlier transceivers was mentioned earlier. The bandspread oscillator (VFO) tunes over a frequency range of 5.5 to 6 MHz and a derivation of this frequency range, resulting from premixing at mixers C and B, is further mixed with the VCO output at mixer A to produce a second signal, divided at 1/N, to feed the phase detector (PD). At lock, this second signal is the same frequency as the reference 500 kHz at the other phase detector input. Band selection is achieved by controlling the division ration at I/N.

In a single sideband receiver, it is necessary to reinsert a carrier signal to carry out detection and in Figure 114 the carrier oscillator is shown as the block CAR. Crystal selection for frequencies 1.5 kHz above and 1.5 kHz below the IF centre frequency provides selection of upper or lower sideband operation.

On the amateur bands, it has been the practice to consider the tuned signal frequency for single sideband as the frequency of the suppressed carrier. For transceivers with an installed digital readout, this is the frequency which is displayed. Shifting the carrier oscillator by 3 kHz to change sideband mode, as discussed in the previous paragraph, is therefore considered as a change of 3 kHz in the tuned signal frequency. To correct this shift so that the digital display reads tuned frequency equal to suppressed carrier frequency, the carrier oscillator output is also mixed with the bandspread VFO at mixer C so that a correction of the 3 kHz shift is reflected in the frequency of the VCO and the digital readout. Earlier systems, such as that shown in Figure 13, did not have a digital readout and did not have the correction fitted.

The output frequency range of mixer C is 14.330 to 14.830 MHz and this is mixed further in mixer B, with either the 10 MHz reference frequency or its second harmonic (20 MHz), to obtain various output frequencies for the different bands as shown on the diagram. These output frequencies are mixed at mixer A with the VFO output to feed the phase detector, via the band select divider 1/N, as discussed in a previous paragraph. All this might appear a little complicated but if you take each band, one at a time, a frequency conversion map can be worked out.

From an operational point of view in amateur band receivers, there is probably little difference in bandsetting using the locked loop system than in using separate crystals. In the TS-130 there are 11 bands of 500 kHz width and there is probably a cost advantage in using the phase locked loop in preference to 11 crystals.

As far as frequency stability is concerned, the weakest link in the receivers discussed is the manually tuned free running VFO. This can be improved by using a further synthesised system with a phase locked loop to control the VFO. However, the problem with such a system is that it must operate at discrete frequency steps separated by a frequency spacing equal to the reference frequency fed to the comparator. Receiving of SSB, CW and RTTY signals of random frequency on the HF bands demands tuning resolution to within hundreds of Hertz. This places a very stringent requirement on the number of discrete steps needed in the programmable divider to provide increments of a few hundred Hertz.

Synthesis on the VHF bands is not such a problem. One reason for this is that a large amount of communication utilises the not-so-frequency-sensitive FM mode. A second reason is that frequency channels have been established at a precise frequency separation. (On two-metres it is 5 kHz). As an example, a typical two metre transceiver might have a synthesised tuning system with 10 kHz steps covering the whole 144 to 148 MHz band. The intermediate 5 kHz points are further selected by switching in a 5 kHz offset to the locked loop. A third reason is that most VHF transceivers are restricted to the one band making tuning less complicated than if more than one band has to be covered.

Bandwidth Control

Ideally, the bandwidth of a communications receiver should be only just sufficient to pass the signal information with high rejection outside the band range. A bandwidth wider than necessary just admits more noise and adjacent channel interference. The bandwidth of the superheterodyne receiver is set by the bandwidth of the lowest frequency IF channel. Ideal bandwidths are several hundred Hertz for CW, 2 to 2.5 kHz for speech SSB, 4 to 5 kHz for speech AM and 14 kHz for 5 kHz deviation speech FM.

Most HF communication receivers have some form of bandwidth control in the last IF channel to select narrow band for CW or wide band for speech. The Kenwood TS-820S amateur band transceiver has a continuously variable bandwidth control together with a sharp notch to tune out an interfering signal close in frequency. Figure 17 illustrates this principle.

Comments on some modern trends

Some of the modern trends in receiver design tend to contradict basic theory outlined earlier. One trend is to use wideband RF

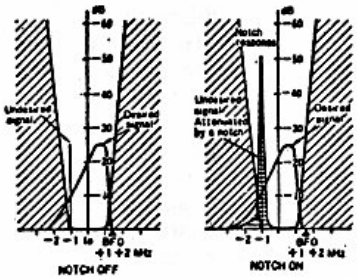


Figure 17: IF Notch in the Kenwood TS-820 Transceiver showing how the IF Notch works.

amplification at the front end of the receiver. This is in order providing the design is such that the image frequency on any part of the tuning range, falls outside the passband of the RF amplifier. This is achieved in general coverage receivers, such as those using the Wadley Loop, by operating a first IF above the maximum frequency of the RF tuning range. On the negative side, one could well expect that the broadband RF stage would be more prone to cross modulation from strong signals in the range, than an RF stage which was selectively tuned.

There have been various suggestions heard by the writer that, as modern MOSFET mixers have noise figures almost as good as straight amplifiers, the RF stage can be dispensed with. Whilst this argument might have some validity, it does overlook the other functions of the RF stage in reducing incoming signal level at the image frequency reducing signal level at the intermediate frequency, reducing cross modulation and regulating the signal level into the mixer for optimum performance.

Another area of change is the use of single conversion with an intermediate frequency higher than that previously considered suitable to achieve the desired selectivity. An example is the 9 MHz IF channel used in many amateur band transceivers. This has all changed because of the wide use of crystal filters which can be made with a controlled bandwidth characteristic and high out of band rejection. Earlier receivers relied on ordinary L and C tuning components which had insufficient Q to achieve the required selectivity at these higher frequencies.

Modern receivers and transceivers make use of digital techniques including the use of micro-processors to provide synthesis of VFO tuning, provision of memory to recall operator preselected frequencies, provision of digital frequency displays, provision of automatic scanning over fixed frequency steps and many other useful functions. This opens up a complete new area of discussion not specifically related to the principle of the superheterodyne and a little beyond the scope of this article. It might be prudent to comment that all these features make operating a dream at a price (in terms of money). However, they have nothing to do with receiver performance in terms of sensitivity, selectivity, signal-to-noise ratio, image performance, cross modulation and, in fact, the ability to resolve one weak signal from another, or to read it in the presence of noise. So think about that before you spend your fortune!

Summary

To summarise the material, we have looked at the basic superheterodyne receiver and varioous factors which must be considered in its design such as, the choice of intermediate frequency, the function of the RF amplifier, oscillator tracking and tuning stability. We have discussed methods of bandsetting and bandspreading including the Wadley Loop and frequency synthesis. We have discussed multiple conversion and application of the superheterodyne receiver in various amateur band transceivers.

As an introductory article, circuit detail and mathematical treatment have been avoided. As it stands, the article should provide some ground work for other more specialised topics on receivers. One topic which the writer feels should follow is the specification of receiver performance and what specific performance figures define a good receiver. A further topic could examine how the well-known amateur band receivers and transceivers all shape up against these figures. The second topic would be quite a task and clearly a job for someone more familiar with the wide range of different amateur equipment than is the writer.

References

1. BUTLER, Lloyd, VK5BR. A Discussion on Mixers, Amateur Radio, April 1988.

2. LANGFORD SMITH, F Radiotron Designers Handbook, Chapter 25 Section 3 - Superheterodyne Tracking.

3. KIRKPATRICK, CB. Three Point Tracking Formulae, IRE Proceedings, July 1947.

4. DIAMOND, Drew, VK3XU. Some Practical Tips on VFO Construction, Amateur Radio, January 1988.

5. A New Receiver Tuning Principle, Amateur Radio, July 1958.

6. Collectors Corner No 2 - The Yaesu FRG-7, Amateur Radio, August 1980.

7. HARRISON, Roger VK2ZTB. Considerations for the Wadley Loop VHF Receiver Front End, Amateur Radio, December 1979.

8. POULTNEY, AEJ. Trends in HF Communications Receiver Design, The Plessey Company.

Author's Footnote

Early in this article, reference was made to Major Edwin Armstrong as evolving the superheterodyne receiver in 1918. According to the publication Australian Radio - The Technical Story, by Winston T. Muscio, there were two patents filed on the supersonic heterodyne principle, one a French patent in 1917 by Lucian Levy of Paris and another in 1918 also in France by Major Armstrong. A further US patent was filed by Major Armstrong in 1919 and issued in 1920.

Whilst most publications give Major Armstrong the credit for the invention of the superheterodyne, there seems to be some question concerning this history! ar

SOLUTION TO INTERFACE PROBLEM

A digital VFO for your FT-101ZD or when is a black box not a black box?

Bob Fincher VK3BRF
60 Raleigh Street,
Forest Hill, 3131

As an amateur, new to the hobby, faced with a bewildering battery of high-technological, feature packed, gee-whiz rigs to choose from, a limited budget, and a pressing desire to get on the air as soon as possible, it was virtually inevitable that I should purchase a black-box! Not just any black-box, but a Yaesu-Musen FT-101ZD - a rig I have grown to love over the last few months because of its excellent performance, good signal reports, and particularly, because you have to "drive" it well to get the most out of it. No automatic antenna tuning, no automatic tuning of the finals circuitry, and not much automatic gain control either. But, still it is a nice rig.

Now that I am working some DX on 20 metres, becoming gradually more proficient, and working a few stations split band using an FV-107 external VFO, life is fairly comfortable. Or was, that is, until I spotted an advertisement for a new (no not mint) FV-101DM VFO, and yes it had all the bells and whistles like digital display, frequency scanning, memories, and more lights than a Christmas tree.

So, I bought the thing, sight unseen, from an out-of-city amateur and went to connect it to the ZD - the rig it was supposedly made for. But wait - what's this second interconnecting cable, and where is the "VFO-B" socket at the back of the rig? Alas, the FV-101DM could only be used with late model FT-101s with serial numbers above 240,000, and the number on mine was about 70,000 too low. A quick call to Stan Roberts VK3BSR, at Bail Electronics, Wangaratta, established that the earlier model FT-101s could indeed be modified to take the FV-101DM, but it was a task to be attempted only by the experienced experimenter, home-brewer or professional. Stan kindly sent me circuits to show what was involved.

To prove a point, Andrew VK3MBM had bought a rig so configured and had also connected a scanning microphone to allow easy frequency changing from the mic console. I have now successfully completed the modifications, repaired a number of incipient problems which could have led to disaster, and in so doing, learned a lot about the innards of black-boxes. In short, they are not so daunting, and anyone possessing normal metal-working and soldering skills, working carefully, should be able to effect the changes. Here is how to do it.

You will need:

2 - Three pin (or five pin) DIN sockets and plugs

1 - Eight pin DIN socket with integral switch (available from Bail Electronics)

or

1 - Eight pin DIN socket and separate DPDT switch

2 - Two lug tag strips

5 - General purpose silicon diodes (OA202 or similar)

1 - 16mm chassis hole punch

1 - Magnifying glass to read the numbers on the DINs

1 - Vacuum cleaner to remove metal and solder swarf

Shielded cable, hook-up wire, plastic cable ties, etc

Circuit diagrams of the FT-101ZD and FV-101DM

'You'll find that your trouble lies in a faulty anode connection in the high frequency stage . . .'

First, unplug the 240 volt mains supply, remove the lower cover of the FT-101ZD, and smartly zap the 900 volt supply electros to ground with an insulated screwdriver until they are discharged. Disconnect and remove Jacks J9 (IF out) and J14 (ATRIP in) from the rear panel, and enlarge their mounting holes to 16 millimetre diameter with the chassis punch. Don't drill the flange mounting holes for the DIN sockets just yet. Drill new holes immediately adjacent to the mains input socket, then refit and reconnect the two RCA sockets.

Solder 350 millimetre lengths of hookup wire to pins 1 to 6 and the switch of the 8 pin DIN socket and lengths of small-diameter shielded cable to pins 7 and 8. Then mount this assembly (VFO A socket) in the new 16 millimetre hole adjacent to the 12 pin Accessory Socket, drilling the flange holes to suit. You can see why bench pre-wiring is the only way! Stan Roberts supplied me with the special combination socket switch (about $6.00), but stocks are low so it is possible to use a separate DPDT switch instead. The switch serves only to restore internal VFO operation with plug A removed and could be omitted if the FV-101DM is always connected.

Mount one of the other three pin DIN sockets, similarly pre-wired, in the other 16 millimetre hole as socket C for mic controlled scanning. The existing six pin DIN socket remains as VFO B, but the ground connection from pin 6 must be removed. Disconnect and remove the four pin microphone socket from the front panel of the unit and replace with an eight pin socket. (And yes, you will need a microphone with scan buttons as well - say a YM-38).

Next, mount one of the tag strips under the left hand (when viewed from the front underside of the set) retaining the screw of the SELECT SW unit PB1966C. The other tag strip is fastened by the screw which retains the metal cover shielding the DRIVER UNIT/TRIMMER BOARD just near the feed-through insulators. Thus no holes need be drilled for these. Finally, cut a 16 millimetre hole in the rear panel of the FV-101DM and mount the other three pin DIN socket, again pre-wired.

Well, that 's the hardest part completed - the rest is routine wiring between the sockets and tag strips as shown in Figure 1 and described below.

1. Wire pin 1 socket A to + 12 volts pin on the RECT A board.

2. Wire pins 2 and 5 socket A to switch S3g USB and lsb positions respectively. Segment 'g' of S3 is identified by the wiring leading from it to J01 on the AF board PB 1964 AF.

3. Wire the five diodes between switch S1A and the new tag strip on the SELECT SQ unit, the cathode ends go to the 160, 80, 12, 10B and 10D switch positions respectively. This gives a 500 wire from pin 4 socket A to the diode anodes at the tag strip.

4. Wire pin 3 socket A to pin 8 on SELECT SW plug J701.

Wire pin 6 socket A to pin 5 on SELECT SW plus J701.

Wire pin 6 socket B to pin 6 on SELECT SW plug J701 via a normally open pair of contacts on the socket A switch. The normally closed contact goes to ground.

Note: Don't mis-count the pins on J701, there is a gap between pins 1 and 2. Ease out the pins on J701 with a small screwdriver to unlatch the lock tangs. Solder the new wires onto the pins.

Push back into J701 and lock.

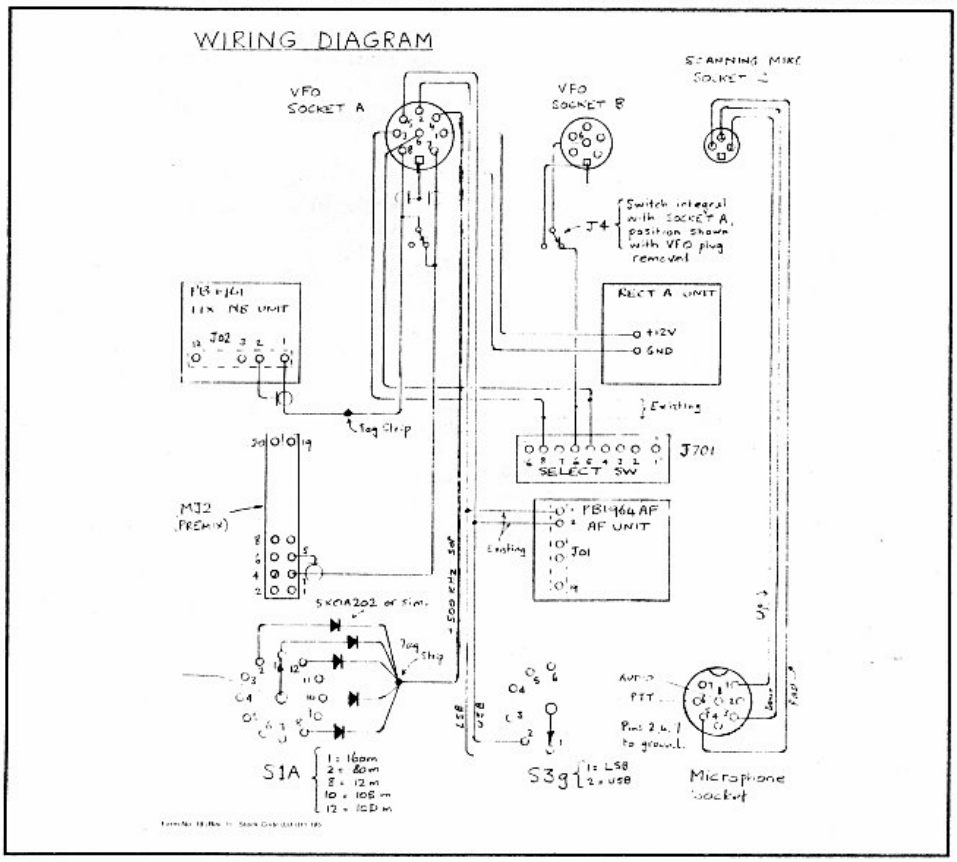
5. Disconnect shielded cable from pins three and five of the chassis-mounted edge-connect socket to the PREMIX board and rewire to the other tag strip. Connect the prewired shielded cable from pin 8 socket A to this point also.

6. Connect the other shielded cable from pin 7 socket A to pins 3 and 5 of the PREMIX edge connector vacated in (5) above.

Much of the wiring can be run in existing looms by squeezing it under and through the plastic cable ties; use new ties elsewhere for a neat finish. The FV-101DM comes with its own six and eight conductor connecting cables for sockets A and B, but a new cable for the mic scanning sockets C must be made up.

Whilst I was delving into the wiring near the rear panel of the FT-101ZD I discovered several wires with melted insulation and exposed inner conductors. These were low-current wires and I can only presume that high RF currents had circulated through them on previous occasions. I replaced the affected wires with the more rigid high-temperature insulation hook-up wire and neatly re-loomed the mess. A criticism of the ZD is that some signal and low-level wiring is routed dangerously close to 240 volt AC fittings. More judicious cable tying and some heat-shrink PVC tubing improved the situation.

After a final check of the wiring, a dab of the vacuum cleaner nozzle to remove those wayward metal particles and blobs of solder from the densely packed componentry, the covers were replaced and whole set-up smoke tested. Miraculously, everything worked straight-off and I am now enjoying the fruits of my labour and a brand new FV-101DM. No, the DX isn't any better, but the pleasure of driving all this technology is great and I certainly know a lot more about the insides of two great little black-boxes. ar



Wiring details

CONTESTS

Commonweath Rules, VK-ZL Results

Federal Contest Manager
Frank Beech VK7BC
37 Nobelius Drive
Legana 7277

Calendar

March	
4——5	ARRL DX SSB contest
11—12	RSGB Commonwealth contest (rules this issue)
18—19	NZART Field day contest
18—19	WIA John Moyle memorial Field day contest (rules February AR)
25—26	CQ magazine WW WPX SSB contest
18—20	BARTG Spring RTTY contest (rules Feb AR)
April	
12—14	YLRL DX/YL to N American YL CW contest
19—21	YLRL DX/YL to N American YL SSB contest
29—30	Swiss Helvetia contest

Rules for the 1989 RSGB Commonwealth contest

1. Date & time:
1200 UTC Saturday 11th March 1989 until 1200 UTC Sunday 12th March 1989.

2. Sections:
Single operator entries only. Entries may be single-band or multi-band only. Multi-band entries will not be eligible for single-band awards.

3. Bands & modes:
A1A only in the 3.5, 7, 14, 21, and 28 MHz bands. Keep in the bottom 30 kHz of each band with the exception of working novice stations in the novice segments. Cross band contacts will not count for points or bonus.

4. Operation:
Entrants must operate from one location only during the contest. As this is a single operator event no assistance whatsoever is allowed during the contest.

5. Exchange:
Contacts may be made with any station using a British Commonwealth prefix, except those within one's own call area.
A contact consists of RST and a serial number commencing with 001 and increasing by one for each contact made during the contest. Serial numbers sent by non-competing stations must be recorded.

6. Scoring:
Each completed contact will score five points. In addition a bonus of 20 points may be claimed for the first three contacts with a Commonwealth call area on each band. Commonwealth call areas for use in this contest are shown in the accompanying list. All UK call areas count as one call area, except for the special contest committee station GB5CC, which will count as a separate call area for all entrants.

7. Documentation.
Separate log sheets using the IARU preferred format (RSGB HFC1) showing; Time UTC, callsign of station worked, RST/serial number sent, RST/serial number received, points and bonus points claimed.
Separate band totals should be added together and the totals shown on the cover sheet. A sheet showing duplicate contacts will be appreciated.
Entrants should note that logs are carefully checked and unmarked duplicate contacts for which points are claimed are penalised at 10 times the number of points/bonus claimed. Logs containing more than five unmarked duplicates may be disqualified. The entry should include a signed statement stating that the station has been operated in accordance with the terms of the entrant's licence and that the rules and spirit of the contest have been observed.

8. Entries:
To the HF Contests committee RSGB, PO Box 73, Lichfield, Staffs, WS13 6UJ, England. Adjudication of this contest will commence on Monday April 10, 1989.
Overseas entrants are advised to forward their logs by airmail.
Entries received after the adjudication date will be treated as check logs.
Entries become the property of the RSGB and in the event of any dispute the ruling of the council of the RSGB will be final.

9. Awards:
(a) Multi-band section: To the overall winner the senior Rose Bowl; to the runner up the junior Rose Bowl and to the leading UK entrant the Col Thomas Rose Bowl.
(b) Single-band section: Certificates of merit to the leading overseas and UK entrants on each band.
(c) Certificates of merit to the leading multi-band station in each Call Area.

Receiving section:

Rules as for the transmitting section except as detailed below;
a) Only the entrant may operate the station for the duration of the contest. Holders of transmitting licences covering the frequencies below 30 MHz are not eligible to take part.
(b) To count for points, a station outside the entrant's own call area must be heard in a contest contact. CQ or test calls will not count for points. A station may be logged only once per band for purpose of scoring.
When both stations in contact are heard, they should be logged separately and points claimed for both entries provided that the stations are outside the entrant's call area. Each completed log entry will score five points. In addition, a bonus of 20 points may be claimed for the first three stations heard in each British Commonwealth call area on each band. All British Isle prefixes will count as one call area. A separate log is required for each band.
(c) The receiving Rose Bowl to the winner, certificate of merit to the leading entrant in each continent.

Commonwealth Call Areas

The following call areas are recognised for the purpose of scoring in the Commonwealth Contest, 1989.

A2	Botswana
A3	Kingdom of Tonga
C2	Nauru
C5	Gambia
C6	Bahamas
G/GB/GD/GI/ GJ/GM/GU/GW	UK
H4	Solomon Is
J3	Grenada
J6	St Lucia
J7	Dominica
J8	St Vincent
P2	Papua New Guinea
S7	Seychelles
T2	Tuvalu
T30	W Kiribati
T31	C Kiribati
T32	E Kiribati
V2	Antigua, Barbuda
V3	Belize
VE1	Maritime Provinces
VE1	Sable Is
VE1	St Paul Is
VE2	Province of Quebec
VE3	Province of Ontario
VE4	Province of Manitoba
VE5	Province of Saskatchewan
VE6	Province of Alberta
VE7	Province of Br Columbia
VE8	Nth West Territories
VK1	Aust Capital Territory
VK2	New South Wales
VK3	Victoria
VK4	Queensland
VK5	South Australia
VK6	Western Australia
VK7	Tasmania
VK8	Northern Territory
VK9L	Lord Howe Is
VK9M	Mellish Reef
VK9N	Norfolk Is
VK9X	Christmas Is
VK9Y	Cocos (Keeling) Is
VK9Z	Willis Is
VK0	Heard Is
VK0	Macquarie Is
VK0/VP8/	
VO1	Newfoundland
VO2	Labrador
VP2E	Anguilla
VP2K	St Kitts, Nevis
VP2M	Montserrat
VP2V	British Virgin Is
VP5	Turks & Calcos
VP8	Falkland Is
VP8	S Georgia
VP8	S Orkneys
VP8	S Sandwich Is
VP8	S Shetland Is
VP9	Bermuda
VQ9	Chagos
VR6	Pitcairn
VS5	Brunei
VS6	Hong Kong
VY1	Yukon
VU	India
VU7	Laccadive
VU7	Andaman & Nicobar Is
YJ	Vanuatu
Z2	Zimbabwe
ZB2	Gibraltar
ZC4	Cyprus (UK Bases)
ZD7	St Helena
ZD8	Ascension Is
ZD9	Tristan da Cunha, Gough
ZF	Cayman Is
ZK1	Cook Is
ZK1	Manihiki
ZK2	Niue Is
ZK3	Tokelau
ZL0	New Zealand
ZL1	New Zealand
ZL2	New Zealand
ZL3	New Zealand
ZL4	New Zealand
ZL7	Chatham Is
ZL8	Kermadec Is
ZL9	Auckland & Campbell Is
3B/B7	Agalega & St Brandon
3B8	Mauritius
3B9	Rodriguez Is
3D2	Fiji
3D6	Swaziland
4S	Sri Lanka
5B4	Cyprus
5H	Tanzania
5N	Nigeria
5W	Western Samoa
5X	Uganda
5Z	Kenya
6Y	Jamaica
7P	Lesotho
7Q	Malawl
8P	Barbados
ZL5	Antarctica
8Q	Maldives
8R	Guyana
9G	Ghana
9H	Malta
9J	Zambia
9L	Sierra Leone
9M2	W Malaysia
9M6/9M8	E Malaysia
9V	Singapore
9Y	Trinidad & Tobago

GB5CC RSGB HQ Station
Other HQ Station

1988 VK - ZL - Oceania Contest

VK and ZL phone results

ZL phone

	10	15	20	40	80	160	TOTA
ZL1BVK			66246	7448		4200	209000
ZL1BXA	8	17000	83187	5			150060
ZL1AGO			137522				137522
ZL1IM	1836	27722	380		45	420	69966
ZK2AH	26144	6660	51615				230996
ZL2ALF	2		2072	2021	605	420	22072

VK phone

AX1RJ	1550	1820	2397	120			21726
VK1LF	285		8		195		
VK2KL	146608	110448	30660	245	2070	120	1018944
VK2APK	8816	41340	28896	3480	6240	640	492357
VK2AYK	162	51272	23241	150	1620	200	255404
AX2BAM	22100		26578		3840		181116
VK2PS	392	4872	6003		1440	200	68985
VK3AKK	474500						474500
VK3AJU	798	8664	41500		1890		164154
AX3SM	72	1188	32625				50343
VK3PSD	16280						16280
VK3XF					1800		1800
VK4LT	71906						71906
AX4PJ	1008	1050	17667	5			40640
VK4OD	4988						4988
VK5QX			231519	60	1800		310450
VK5NVW	112420						112420
VK6ANC	32	6528	65740		780		73080
VK6PJL		1248					1248
VI88XPO	Check log.						

SWL phone

ZL2259	1792	84	80410		2430		186276

ZL CW

	10	15	20	40	80	160	TOTAL
ZL1BSG		100128					100128
ZL1AIH					13800		13800
ZL2AGY	5814	32550	5084	52700	910	180	409276
ZL2AKT	1080	1056	2236				13090
ZL3KR	11220		64599		4370		201804
ZL3AGI			39591				39591
ZL0AJB (HB9CSA)			15132				15132

VK CW

VK2APK	18560	31030	9040	72675	1680		595700
AX2BQQ	9322	40182	35076	209000			424101
VK2DID	448	26970	3038		1120		85412
VK2PS	1914	3456	6164		990		51324
VK3CQ	3876	7452	21700	450	1900	20	159300
VK3AHQ			115260				115260
VK3DNC	1998	15776	2544				51337
AX3XB	18104						18104
VK3AMD	2560						2560
AX3KS	220	672					1664
VK3XF					1280		1280
VK4TT			144840				144840
AX4XA	114100						114100
VK4XW	680	128	16	80	1800		11760
VK4SF		722	16	840	40		4884
VK5ADX	432	32028	10965	22550	480	20	258129
VK5AGX	1260	10492	29283	12255	960		226368
VK6AJ	81220	51208	7725				334712
VK7RY	200	648	3234		600		18426
AX8XX	52440	119024	44394	16080			863785

VK & ZL individual band scores

band	CW	phone	CW	phone	CW	Phone	CW	Phone
Open	VK2KL	1018944	VK8XX	863785	ZL2AH	230996	ZL2AGY	409276
	VK2APK	492357	VK2APK	595700	ZL1BVK	209000	ZL3KR	201804
	VK3AKK	474500	AX2BQQ	424101	ZL1BXA	150060	ZL1BSG	100128
10	VK3AKK	474500	AX4XA	114100	ZL2AH	26144	ZL3KR	11220
	VK2KL	146608	VK6AJ	81220	ZL1IM	1836	ZL2AGY	5814
	VK5NVW	112420	AX8XX	52440	ZL1BXA	8	ZL2AKT	1080
15	VK2KL	110448	AX8XX	119024	ZL1AGO	137522	ZL1BSG	100128
	VK2AYK	51272	VK6AJ	51208	ZL1BVK	66246	ZL2AGY	32550
	VK2APK	41340	AX2BQQ	31030	ZL1IM	27722	ZL2AKT	1056
20	VK5QX	231519	VK4TT	144840	ZL1BXA	83187	ZL3KR	64599
	VK6ANC	65740	VK3AHQ	115260	ZL2AH	51615	ZL3AGI	39591
	VK3AJU	41500	AX8XX	44394	ZL1BVK	7448	ZL0ABJ	15132
40	VK2APK	3480	VK2APK	72675	ZL2ALF	605	ZL2AGY	52700
	VK2KL	245	VK5ADX	22255	ZL1IM	45	———	
	VK2AYK	150	AX2BQQ	20900	ZL1BXA	5	———	
80	VK2APK	6240	VK3CQ	1900	ZL1BVK	4200	ZL1AIH	13800
	AX2BAM	3840	VK4XW	1800	ZL1IM	420	ZL3KR	4370
	VK2KL	2070	VK2APK	1680	ZL2ALF	420	ZL2AGY	910
160	VK2APK	640	VK3CQ	20	———		ZL2AGY	180
	VK2AYK	200	VK5ADX	20	———		———	
	VK2PS	200	———		———		———	

The contest manager speaks.....

This is the first time I have been on the receiving end of the contest logs - checking on who had worked what and when - but it has been an enjoyable experience, much helped by the many excellently presented logs. Computer prepared logs, or logs presented with computer prepared dupe sheets and summaries are on the increase, and this is welcomed. Some entrants will find their final score quite different from their calculation, but in most cases, this was due to them making a simple mathematical error!

What can be done to increase activity? Many overseas entrants commented on lack of activity, particularly from ZL. The results as published confirm this. On the other hand, I have been overwhelmed by the number of overseas logs received, particularly from Japan and Europe. So fellows..... your comments please; and again thank you to all participants. ar

John, ZL1AAS

EDUCATION NOTES

Survey Comments

Federal Education Officer
Brenda Edmonds VK3KT
PO Box 883
Frankston 3199

Over the last few weeks I have spent some time logging and collating the comments which were received from members along with their Survey returns.

These comments, criticisms, suggestions and compliments have been a totally unexpected bonus from the survey. It seems that members are prepared to put pen to paper when there is another reason for communicating, but from the tone of many of the comments they have not been prepared to write a special letter about the problem. Some strong feelings and long held 'gripes' have surfaced, so if the survey has allowed dis-satisfied members to 'sound off' it has served an extra purpose.

The only way we can be aware of members problems or complaints is if they let us know.

In several cases, the grudge could have been sorted out fairly simply and quickly if it had been brought to our attention at the time, but has grown and hardened with delay.

A number of interesting points have been raised. Some of them have already been or are being considered at either Divisional or Executive level. The new ones will be discussed by Executive or, if more appropriate, passed to the Division or Co-ordinator concerned (while still maintaining the confidentiality of the survey).

All will be noted and acknowledged as time permits, and a summary of comments will be published.

In an organisation as complex as the WIA, the communication channels are necessarily tedious and slow, and it is easy to miss out on some of the information which is being disseminated. In addition, member's interests are varied and subject to change, so it is hard to be sure that the information distributed is always received.

Comments from members are always welcome, but is has become obvious from this batch that members are not all aware of the usual channels.

The best place to start when commenting or seeking information is your local Division. Each Federal Councillor should be familiar with current and recent matters under discussion by the Division or the Executive, with matters to be raised at the Federal Convention and with the names of Co-ordinators or sub-committee chairpersons.

Do not wait until some other reason for writing occurs, especially if it means you are going to hold a grudge until the problem happens to be solved. But we cannot solve your problems or investigate your complaints unless we are told about them.

Incidentally, we did enjoy receiving the ones which were complimentary, encouraging or appreciative.

Thank you all for your interest, and the time and thought which went into those extra notes.

73,
Brenda VK3KT. ar

AWARDS

Best Yet Guide to Awards

Federal Awards Manager
Ken Gott VK3AJU
38A Lansdowne Road
St Kilda 3183

The most comprehensive guide to amateur radio awards is undoubtedly the one produced by the Radio Society of Great Britain. Its first edition was published in 1973 and now a third edition has just come off the press. It is simply called "amateur Radio Awards" and the editor is Chris Henderson G4FAM.

The book runs to 186 pages and is a model of systematic and precise presentation of data. Awards are arranged alphabetically by country and then by title. Details of each award are set out in a standard form, and most have checklists with space for entry of callsigns worked in progress towards winning the award. Even awards requiring several hundred QSOs have these checklists.

A numbering system is used not only for indexing and cross-referencing of awards, but also to indicate whether the information on award rules, costs, etc is quite up-to-date or only moderately so.

Awards are indexed by title and separately by subject (eg ITU and CQ zones, countries, continents, cities, regions, locator squares and other criteria).

The book is highly recommended to those interested in pursuing awards, including SWLS (where awards are available on a "heard only" basis this is stated). There is simply no better guide to awards and I will be keeping a copy in my shack.

The price is £8.18 to non-members of the RSGB and airmail postage to Australia is £3.18, surface mail £1.02. The address of the RSGB is Lambda House, Cranbourne Rd, Potters Bar, Hertfordshire EN6 3JE, Great Britain.

My appointment as VK certifying manager for the Worked All States Award of the American Radio Relay League is a good example of how the WIA is constantly expanding its services to members. However, while this saves members the cost of sending the 50 QSL cards to the USA (and getting worried about them), you must still make your own application to ARRL on the prescribed form. I merely certify that you have the cards. Return postage, please for those 50 cards.

Special LX Award

Luxembourg is one of the oldest countries in Europe, tracing its foundation back to AD963. However, for almost five centuries it was under foreign domination, including periods of Spanish, French, Austrian and Dutch rule.

In 1839 the main European powers signed the Treaty of London, granting Luxembourg independence under the King of the Netherlands. The last male descendent of the king died in 1889, and since then Luxembourg has had its own line of Grand Dukes as heads of state.

The Luxembourg amateur radio fraternity is now offering a special award to mark the 150th anniversary of modern Luxembourg under the Treaty of London.

Applicants must score 150 points by contacting LX stations during 1989. For VKs, each LX counts 20 points except QSOs with the country's club station (LXORL or LX150L) which count 30 points.

There are no restrictions on bands or modes, but each LX station may be contacted only once on each band.

A list of QSOs with date, hour, callsign, frequency and mode for each one, certified by a club official or two licensed amateurs should be sent to: Reseau Luxembourgeois des Amateurs d'Ondes Courtes, PO Box 1352, L-1013 Luxembourg, Luxembourg, along with 10 IRCs or US$6. A self-addressed adhesive label should also be enclosed.

Applications should bear postmarks dated prior to July 31, 1990.

DXCC Updates

	CW	Phone	Open
VK1ZL		272	
VK2AKP	117	230/292	290/2292
VK3OT		3003/3007	306/310
VK3QI	263/269	3009/316	311/318
VK3DYL	279		
VK4BG		286/297	291/307
VK4KS		318/349	318/357
VK5MS		319/366	
VK6AJW		295/297	

Awards issued recently

WAVKCA

1604	Yasuo Takenaka JK1HSQ
1605	Kazuo Kusano JA6WFK
1606	Peter Kratzl OE1ZL
1607	Minoru Nagata JA5EYW
1608	Gunawan Wibisono YB0BOK
1609	Kazuo Saito JE1GNG
1610	Hiromi Tokuchima JE3SAE
1611	Gunter Rehbein Y26XM
1612	Tony (Mack) McClure N4SKE
1613	Dave Paperman WQ5Y
1614	Toshio Muraji JA3BLN
1615	Kozo Sugatani JA3GD
1616	Martin Benoit VE2EDK
1617	Toshi Tayama JH1BRP
1618	Giorgio Micheletti 5N9GM
1619	Raymond Lee VS6UW
1620	Hirofumi Ochi JE1DTV
1621	Masao Sekine JA1PAH
1622	Frank Pedersen OZ3FS
1623	Katsumi Yoshida JA7MLG
1624	Zenya Koono JA1WJ
1625	Keishi Murakami JE4LPH
1626	John Reasoner WA4QMQ
1627	John N. Kirkham KC4B
1628	Russ Wilson VE6VK
1629	Arnold Oberson W2OB
1630	Peter J. Lamont ZS6AJG
1631	Gary J. Moles ZL2AKI

INTRUDER WATCH

New Co-ordinator

Bill Horner VK4MWZ
26 Iron Street
Gympie 4570

Hi, My name is Bill Horner, VK4MWZ. At the end of 1988, Bill VK2COP retired as Federal Intruder Watch Co-ordinator and I was elected as the new FIWC. I was first licensed in February 1987 as VK4MWZ. Since then I've been active on the DX bands like any other new ham. For the last 12 months I've served on the WIAQ Council as Research Officer. I'm a member of 2 clubs and enjoy them immensely. I moved to GYMPIE about 8 months ago with my new wife who doesn't give me too hard a time when it comes to AR. Other hobbies include; ten pin bowling, fishing, golf, indoor cricket, etc. If you have any queries then please drop me a line to the above address, or ring (071) 82 5272..

My first report.

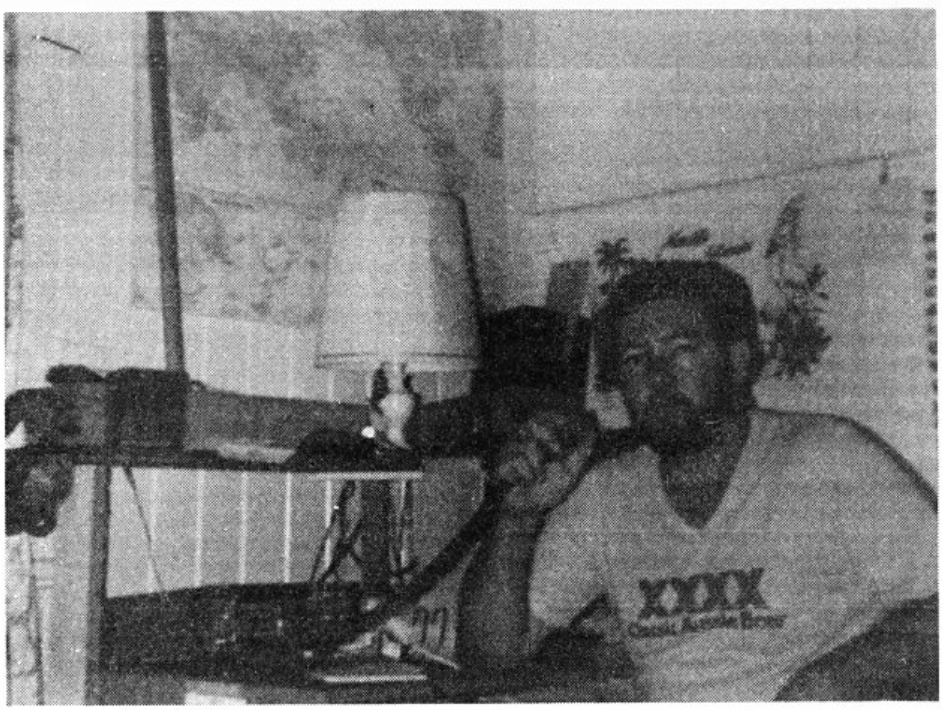
Many thanks to those who have helped to make my first month go so smoothly. Reports received from VK2COP, VK4's AKX, BXC, BG, BHJ, BTW, MWZ, VK5's, TL, GZ, XW, VK6RO. It's very clear to me that we need many more people for the IW service. Please make sure that the deadline is adhered to, I have to send my full summary by the 12th day of each month.

We urgently require state IW co-ordinators in VK's 1,2,7. If you can help then please contact me.

There appears to be an ever increasing amount of intruders on the 40m (7MHz) band. If we wish to retain this band for amateur use we need to concentrate our reports thus. This doesn't mean that the other bands aren't important however the first band in danger of being lost is this band.

Finally I take this opportunity to say thank you to Bill Martin, VK2COP on doing a marvellous job with IW over the years. Bill take a well earned rest, from all many thanks.

ar



Bill Horner VK4MWZ

CLUB CORNER

Paper Chaser's Fiesta

The Moorabbin and District Radio Club is inviting all interested amateurs and SWLs to bring their award certificates, medallions, plaques and trophies for display at its clubrooms on the afternoon of Saturday, April 1.

The club has ample space for displays of awards, framed or unframed, on walls and tables.

Two prizes will be offered - one for the largest collection displayed, and the other for the most meritorious.

The club thinks that this gathering of award chasers may be the first of its kind in VK3, or even in the whole of VK.

It emphasizes that the prizes will be given on the basis of recognised amateur awards. Certificates earned as place-getters in contests or for participating in contests, will not count, although owners are welcome to display them.

Judging will commence at 2.30 pm but the rooms will open an hour earlier to enable entrants to set up their displays.

There is no formal entry form or fee, but those intending to display their awards are asked to phone the club secretary, Doug VK3CCY, at 583-4462 (H) or 553-4566 (O) so that the organisers can estimate space needs.

Entrants and visitors will be able to consult copies of the latest worldwide guides to amateur awards, eg Sue Squibb's guidebook (reviewed in last month's AR), the latest RSGB handbook on awards, and the chapter on awards in the ARRL Operating Manual. These sources give details of many hundreds of amateur awards.

Data sheets and application forms for many overseas awards will also be available for inspection and copying.

There will also be a "trading post" where those interested in buying or selling IRCs, green stamps, or other units of exchange can get together and do deals.

Orange and District Amateur Radio Club

Special-event, QSL Cards mailed direct to all Amateurs who contact Club Station VK2A0A/P is one feature of ODARC's Demonstration Station at the third Australian National Sports and Leisure Show in Orange, NSW on Friday, Saturday and Sunday, March 10, 11 and 12,1989. The attractive Card features full-colour photographs of Orange district scenes and, being unique to this event, will be highly prized world-wide. All Amateurs are invited to contact VK2AOA/P.

Club members will operate the Station from 2300 to 0600 hours UTC daily on these frequencies (SSB plus or minus QRM) 7.050 -

10.125 - 14.150 - 21.150 - 28.450 MHz. CW will also be used on occasions. VK2AOA/P will use as many other bands and modes as possible, including packet radio on two metres. ATV on 70cm, two metres FM and SSB (local daylight-saving times are 1000 to 1700 hours).

As the Sports and Leisure Show attracts many thousands of visitors from around New South Wales and from interstate and overseas, there are likely to be Amateurs coming as part of family groups. These operators are invited to call in at the Station at No 6 "A" Street (near the main entrance), "wet the whistle" with the friendly Orange Club people and, perhaps, help out for a while with operating and explaining to visitors what a great thing is this Amateur Radio, while the family do what they wish. Show Bags will be given to interested visitors and include information sheets, novice starter kits, typical magazines, enrolment forms for classes and exams, experimental circuits, catalogues and so on.

The Club's main aims in setting up this Station are to introduce Amateur Radio to the masses, to improve the image of our hobby in the eye of the media and the public, and to attract new recruits to the hobby via our classes (which start in March for the August DOTC exams at all levels). Since the Orange City Council's Tourist Centre is sponsoring the Station's special QSL Cards, yet another main aim is to invite visitors to this fair City.

If more information is required, please contact the Secretary of Orange and District Amateur Radio Club (Inc), Geoff Selwood VK2KJX, at PO Box 1065, Orange NSW 2800 or telephone (063) 61 5333 (Business), (063) 62 7520 (Private). If you work any Orange Stations, they should also be able to supply other details, if needed.

NEWS BRIEFS

Pay Television for Australia?

The Federal Government is considering whether to allow pay television on a spare UHF channel currently available in all capital cities.

Pay TV is a system where viewers using special decoders can receive a variety of programs by paying a basic monthly subscription with extra charges for special events and services.

Other options for the system are to use the Aussat satellite or provide the service through optical fibre cables.

The Australian Government imposed a four year moratorium in 1986 on pay TV which was already operating in most other advanced countries.

Its main advantage is that it gives viewers more choice with typical services offering specialist news, first run movies, sport, children's and music channels.

The Government has recently issued a discussion paper for public comment before it makes a decision on introduction of pay TV and the medium it should use for transmission.

SPOTLIGHT ON SWLING

Solar Activity

Robin L Harwood VK7RH
52 Connaught Cres
West Launceston 7250

As I am writing this in mid-January, we are experiencing phenomenal solar flux readings, which have produced exceptional conditions on the higher frequencies. There are, as well, accompanying solar flares which also can cause shortwave fadeouts. The predictions are now that this Cycle could possibly peak early in 1990 or even around September of this year. I find the daily propagational forecasts from the IPS in Sydney via Radio Australia indispensable. They are at 0425, 0827, 1227, 1625 and 2025 UTC. As well, WWV at Fort Collins, Colorado gives the Solar Flux and Indices at 18 minutes past the hour on the Standard frequencies of 5, 10, 15 and 20 MHz.

During the mid-January peak, I was hearing Radio RSA in Johannesburg, South Africa on 11760 kHz at 0200 UTC. It was in English and I suspect that I was hearing the back of the beam, as it was broadcasting in English to North America because the signal was fluttery. The next day, there was no sign of it, yet that was not surprising as there were frequent solar flares after the solar flux peaked around 0248. African signals generally don't come in well here in West Launceston, so I was pleased to hear propagation picking up. The only consistent African to come in regularly is the Radio Japan relay from Moyabi, Gabon. This is heard daily on 15235 kHz from 0500 till 0700 UTC in various European languages. The station was last year broadcasting to Oceania from Japan on the same channel simultaneously with the General Service and had to QSY to 15270 kHz to get a clear frequency. Unfortunately its service to Australia and N Z from 0900 to 1000 UTC on that channel experiences co-channel interference from the Voice of Free China in Taipei, which broadcasts to SE Asia in Chinese and has done so ffor many years.

There must have been a conscious decision by many international broadcasters to cease issuing full detail verification cards and issue standard response cards or slips. The latest to do so is Radio Japan. It is quite understandable that this is a tiresome chore and it is also noticeable that the broadcasters want more feedback on the programme content rather than signal quality. The art of DXing is declining as less are getting motivated to join any of the clubs while computers and other hi-tech pursuits have attracted the young. Most clubs have found that they have a more mature membership, mostly retired with time on their hands.

However, the number of listeners on shortwave is increasing, and particularly from the business and intellectual communities, who rely on primarily news and information, rather than any technical interests. The BBC World Service in October increased the number of financial bulletins from three to eleven daily, as well as bringing an hour-long "Newshour" daily at 2200 UTC. Radio Japan also regularly includes the latest information from the Tokyo financial markets in their news bulletins.

It also appears as if Radio Australia has made a decision to concentrate mainly on the Pacific and S E Asian audiences. The senders near Townsville should become operational soon and will be aimed at Melanesia. Also, Radio New Zealand is to get two 100 kW senders and concentrate on their Pacific audience. The callsign of the station will change, as it won't be a part of the BCNZ and will operate under contract to the Ministry of Foreign Affairs. Both organisations are acutely conscious of their large regional audience, who have come to rely on their impartiality in news and current affairs, during recent domestic crises within the region.

The next broadcasting period will commence on the 4th of March, yet the majority of international stations will make their seasonal frequency alterations on the 26th of March, when daylight saving commences in continental Europe. Both periods commence at 0100 UTC.

Well, that is all for March. Until next month, the very best of listening and 73 - Robin L. Harwood VK7RH.

ar

POUNDING BRASS

Mostly about keyers

Gilbert Griffith VK3CQ
7 Church St
Bright 3741

While browsing through the local newsagency the other day I came across a paperback book by Hugh Atkinson called "The Longest Wire", and bought it. The story is mainly a drama but it is based on the building of the overland telegraph between Adelaide and Darwin and is set in the early 1870's. I was a little disappointed that there was little or no reference to Morse Code as such, but it was a good yarn all the same. The many pitfalls encountered will amaze you.

Referring back to January's column where I featured Electronic Keyers and Paddle Technique. I have had some enquiries on the availability of kits, paddles and components. Unfurtunately I have not been approached with offers of second-hand equipment and will not part with any of my own in lieu. To save you time in searching I have the following information.

To date, you can get a Galbraith paddle from Dick Smith for $25 (about $10 off) but they have limited stocks and will not be re-ordering.

I believe Emtronics have Bencher paddles and some electronic keyers but I don't have their latest catalogue yet.

Curtis 8044 chips are available direct from Curtis Electro Devices Inc., Box 4090, Mountain View,. CA 94040 or phone 415 964 3846 junk in some forgotten corner of your shack, please consider sending them to me as I have numerous requests to supply pre-loved gear of the Morse kind. By the way, VK3CNX, did you get the 8044 I sent? Please write as I've lost your address.

I have letters from many Amateurs who are taking their first steps to becoming fully-fledged Morsiacs. This is a step which, naturally, I can highly recommend, even for newly licensed lids. But Morse is a mode which should be given a decent try. Especially considering the effort most people put into passing their exams. While you are feeling your way into the WIA, local clubs, handbooks, conventions, etc.,. you can hunt up the key or keyer that you are sure to need. Place a wanted ad in the Hamads if necessary or maybe build a paddle using an old hacksaw blade, nails and a block of wood. Then if your rig has a built-in keyer, you can get right down to practice.

You will also have to learn to solder and I believe this should be a requirement of the Amateur exams. A cheap iron and some patience is all you need to master the art of soldering, and you will find plenty of things to fix around the house, as well as the fact that little jobs like antennas and cables will become a cinch. Don't be afraid to lash out on that 8044 chip you've always wanted even if you wire it up rats' nest fashion; no-one will notice if you stuff it in a nicely painted box, as long as it works — who cares?

If you spend a few evenings buiilding a keyer, and maybe longer getting the bug out, it will encourage you to spend the many hours

required on air to become easy and relaxed with the code. I can assure you that once you get to that stage you will wonder what all the fuss was about, and settle down to really enjoying yourself.

Finally this month I would strongly recommend reading everything you can get hold of, borrow stacks of old magazines if you can as they have plenty of interesting circuits and ideas. If you can afford it, get as many reference books as possible as they always come in handy, even if just to stand on to reach the top shelf.

73's es 88's. Gil VK3CQ (hardly ever on air myself these days). ar

(I know the problem only too well, Gil! Ed)

BACKGROUND

WIA Planning for WARC 1992

Administrative conferences of the International Telecommunications Union, or the International Telegraph Union as it was known as prior to 1932, have been dealing with radio since 1906. However, it was the 1927 Washington Conference that established the Amateur Service and ever since then each successive administrative radio conference has had some impact on the Amateur Service and since 1963 the Amateur Satellite Service.

The Amateur Service has had representation at all conferences since 1927 although limited at the earlier ones. In 1959 a WARC was held which gave all the indications of being critical to the existence of the Amateur Service. The WIA, being aware of this, lobbied hard and were successful in having John Moyle VK2JU accredited to the Australian delegation as an official observer.

Prior to John Moyle's attendance at the Conference in Geneva, a fund was set up to finance the project and the amateurs of Australia rose to the occasion with their support.

The next major WARC was in 1979 at which David Wardlaw VK3ADW and Michael Owen VK3KI were full members of the Australian delegation. In 1978 they also attended the Special Preparatory Meeting of the CCIR in Geneva which prepared the technical basis for the WARC in 1979. Australia presented one of the papers at this meeting which helped to lay the foundations for our success at WARC 79.

At the 1988 Federal Convention the Federal Council examined a number of future WARC related matters and provided guidance, including a detailed consideration of our attitude to each amateur band, for our IARU Region 3 delegation to the Seoul 88 conference. The Council also provided guidance on representation, both to the national authorities and through IARU for the next WARC which will be held in either 1992 or 1993.

At Seoul the regional societies adopted the report of Working Group 2 which concentrated upon international representational matters with emphasis on WARC92. That report has been published in Amateur Radio magazine for January 1989.

Aim

The aim of this paper is to establish WIA guidelines for WARC92 planning in Australia.

Considerations

This paper will follow the consideration sequence adopted by Working Group 2 at Seoul in Oct 88 where considerations were arranged in three major groupings as follows:

Spectrum allocation needs.

Regulatory matters.

Actions required in support of these objectives (principally involvement in preparation for a WARC).

Spectrum Allocation Needs

As noted above the WIA at its 1988 Federal Convention set out in considerable detail a review of its attitudes to retention, expansion and seeking of new spectrum allocations in its negotiations with DOTC over the next few years. That Council resolution was submitted to the IARU Region 3 conference in Seoul and was considered by Working Group 2 when they reported upon spectrum allocation needs for the Region.

Looking first at allocations below 30 MHz, WG-2 recommended few variations from the WIA position. The user status for several bands varied slightly as did the proposed bandwidth to be sought, however, the greatest deviation was inclusion by the WG of a bid for a shared primary worldwide allocation at 5.005-5.060 MHz. The WIA delegation saw this addition as a useful objective because of its potential coverage within Australia.

Turning to allocations between 30 MHz and 10.5 GHz. Again apart from some changes to band user status, Regional additions to the WIA position include seeking 220-225 MHz and 902-928 MHz bands in Regions 1 and 3 to align with the Region 2 position.

Footnotes to the ITU frequency allocations make considerable changes to that table on a Regional or national basis. The IARU Region 3 position is to seek extensions or deletions of those footnotes where the changes proposed are to the advantage of the Amateur Service and the Amateur Satellite Service (for we must not forget this important aspect of amateur radio!)

Regulatory Matters

The principal regulatory matter concerning the Region and the WIA in particular is third party traffic. It is the consensus of the Regional societies that amateur to amateur through amateur communications should not be classed as third party traffic and prohibited internationally under ITU Radio Regulation 2733. In contrast societies had no difficulty with Radio Regulation 2734 concerning bilateral agreements between national authorities in order to permit third party traffic between persons not licensed amateurs.

At Region 3 Seoul 88 Working Group 2 recognised this constraint on third party communications and saw three possible avenues open to national societies. These are, in order of complexity to implement::

Firstly to make representations to the national authorities to permit the retransmission of information received from other amateur stations and that such reception and retransmission of amateur originated information be not treated as third party traffic as referred to in para 2733 of the Radio Regulations.

Secondly IARU member societies could press their national authorities to include a definition of "Third Party" for the Amateur Service in the Radio Regulations.

Thirdly IARU member societies could press their national authorities to review Article 32 and amend 2733 to permit third party traffic where the third party is a licensed amateur.

It is recommended the WIA follow the Region 3 guidance above.

Actions Required in Support of These Objectives

There were six broad action areas identified by Working Group 2 at Seoul which affect all member societies, including the WIA. They will be discussed in some detail in the following paragraphs.

The first action area involves getting national administrations to include proposals supporting the amateur radio objectives identified earlier in their national submissions to relevant ITU Conferences and CCIR Meetings leading up to WARC. This can only be achieved through amateur member involvement in the Australian Preparatory Group (APG) deliberations leading to the national position papers. That amateur representation must be regular, continuing and technically competent.

The second action concerns obtaining national authority support for proposals advanced by other administrations. Again an accredited amateur member of the APG is the means of achieving this aim.

The third action involves getting appropriately qualified members of the Amateur Service and the Amateur Satellite Service included in national delegations to appropriate ITU Conferences and Meetings. That is to conferences and meetings which have matters concerning our Services on their agendas. This can only be achieved through a process of developing the national authorities confidence in the skills and abilities of the amateurs identified and involved

in the APG.

A further consideration relevant to this action is the financing of any amateur members of the national delegation. Our government is usually willing to accept assistance in the form of accredited amateur additions to their delegation at noadditional government financial outlay, however, seeking financial support for the travelling allowances incurred may be very difficult. Consequently the Australian amateur movement and in particular the WIA must be prepared to outlay some $15000 per amateur delegation member (made up of $2700 fares and $8875 ($222-40 days) travelling allowance, based upon IARU Region 3 estimates and provisions together with $3500 for local travel to APG meetings).

On the subject of representation, no useful gains can be achieved by the WIA financing a member to join the IARU observer team. This is because the IARU has only observer status and representation by Region 3 is included in their budget. Furthermore, it is a matter for which the Regional Directors are responsible

The fourth action is concerned with the WIA developing relationships with key persons in ITU affairs to ensure those persons are fully briefed on amateur matters. This is a two fold action, firstly through amateur membership of the APG and secondly through special briefings targeted at key persons. Such briefings need to be co-ordinated to present a consistent viewpoint and carried out in a professional manner, obviously not a task for the casual "do-gooder".

The fifth action is one of keeping the Secretariaat IARU and the Secretary, Region 3 fully informed of national preparations. This action can be difficult to achieve because of the need for any amateur members of the APG to preserve the necessary confidences of that body. Nevertheless it should be possible to provide broad indications to the Secretary and through requests for additional information ostensibly for presentation to the APG, to provide an indication of problem areas. Any conflict of interest can be buffered through third parties such as IARU liaison officers.

The sixth and last action concerns re-affirmation of Regional Conference motions arising from Auckland 1985 to do with Regional Association preparations for future ITU Conferences and Meetings, including provision of adequate funds to carry out such actions. One specific item identified was amateur radio involvement in CCIR conferences including national preparatory work. Region 3, at Seoul 88, ih setting the budget for the next three years, made appropriate provisions for anticipated Conferences and Meetings. These included a WARC92 element to fund two Region 3 delegates to the IARU observer group each to be in Geneva for half of the Conference.

The implications of this action for the WIA are to devote attention also to CCIR preparatory meetings held in Australia.

CONCLUSIONS

WIA and IARU Region 3 preparations over the past few years have stood the amateur service in good stead in the build up to WARC92. The next step is for the Federal Council to endorse the planning carried out and determine how to fund its implementation.

RECOMMENDATIONS

It is recommended the Federal Council:

ENDORSE the spectrum allocation proposals adopted by IARU Region 3 at Seoul 88, to which the WIA contributed significantly through its detailed guidance arising from the 1988 Convention.

ENDORSE the proposal that the WIA follow IARU Region 3 guidance in its approach to the national authorities for less onerous third party traffic operating conditions.

ENDORSE WIA involvement in APG considerations for ITU Conferences and Meetings through the accreditation of one or more competent amateurs to that body, noting the associated internal travel expenses resulting during the period up to WARC92.

DIRECT/ENCOURAGE amateur members of the APG to influence that body's support of amateur proposals advanced by other administrations.

ENDORSE the WIA proposal to seek inclusion of one or more competent amateur members on the Australian delegation to ITU Conferences or Meetings at which amateur matters are included on their agendas. NOTING this will be confined to WARC92 in the first instance and that initial negotiations will aim to seek government funding of all or part of the delegates travel expenses.

ENDORSE the creation of an amateur radio movement WARC92 fund, managed by the WIA and tasked to generate $15 000 by the end of 1992.

ENDORSE the concept of cultivating the awarenes soft key persons involved in ITU affairs and NOTE that briefings must be co-ordinated and given in a professional manner.

DIRECT those WIA members involved in APG representation to keep the Secretary Region 3 fully informed of national preparations, NOTING any requirements to maintain such confidentialities as APG involvement incurs.

ENDORSE the continued involvement of WIA membaers in national CCIR preparations. NOTING this may place a significant workload upon a few volunteers. ar

FORWARD BIAS

VK1 awards net and broadcast

Norm Gomm VK1GN
Publicity Officer
VK1 Division

The Division is looking for additional volunteers to help man the VK1 Awards net immediately following our Sunday night broadcast. So if you would like to be an all-powerful net controller and propagate the good name of the VK1 Division, please contact me or any of the other Committee members.

Operators are also required for the weekly broadcast and or relaying on the other frequencies. You don't have to be a Committee member to do the broadcast and new faces (or voices) would be most welcome.

It was nice to hear a large number of callbacks to the broadcast recently. We know that there are many more listeners than callbacks and would like to encourage the "silent majority" to join in. It provides your Committee with feedback and makes the broadcaster feel that he or she is appreciated.

MONTHLY MEETING

The January monthly meeting was supposed to be a video night, but due to the ever watchful Murphy they didn't turn up. Flexible as ever, Rob VK1KRM and Paul VK1BX swung into action and gave us a top quality run-down on repeaters and their problems.

This dynamic duo covered siting, service area, antenna patterns, adjacent services, receiver and cavity design, among many topics. Their message was loud and clear. Amateur repeaters are competing with commercial services, therefore our repeater specs must be at least commercial standard if they are to survive.

An informative and thought provoking night. Thanks to Rob and Paul for stepping into the breach at very short notice.

VK6 TAPE

Courtesy of the VK6 Division, the VK1 Division was fortunate to be able to use a BBC segment on Amateur Radio on its weekly broadcast. Response from local amateurs was very positive. It was good to see a media organisation get its facts right and show the hobby in a good light.

Thanks to VK6 Division for the copy of the tape.

ALAN'S FAREWELL ADDRESS TO THE TROOPS

It is with considerable regret that I stand down from the Presidency after some five or six years in the job. It is a very crucial time for amateur radio and I would have liked to remain at or near the helm during this period, but as most of you know my work situation precludes this.

I have been moved by the numerous expressions of appreciation received in last days of this term of office. I thank you all, but very strongly make the point that none of it would have been possible without the support and efforts of committee members and other office bearers.

I will now look forward to playing amateur radio for a change and hopefully you will hear me at times other than broadcasts and contests. ar

73 de Alan

TEN YEARS AGO

What An Inspiration!

Bruce R. Kendall VK3WL
8 Walwa Place
Werribee 3030

I was one of many who knew Graham Clements. He was an inspiration to us all for one so young.

Graham was involved in many facets of Amateur Radio such as ATV, Satellites, HF, VHF and UHF, and took a keen interest in the many other modes and activities available to us.

It all started in 1968 while Graham was attending the Sunshine High School in Melbourne's West. He became interested in radio and electronics, joined the Youth Radio Club Scheme and qualified for several certificates issued by the YRCS.

During 1972 he became licensed as VK3ZLT. A receipt dated 18 March 1972 shows details of the purchase of 2M FM and AM transmitters, a 2M whip aerial and co axial cable for the sum of $122.00. The place of purchase was believed to be somewhere near the Mt Dandenong foothills. An unidentified signature appears on the bottom of this receipt.

On 21 March 1974 Graham took out what was to become a well known callsign around the traps, VK3TK.

Graham joined the WIA in 1972, the same year he also became a member of the Western Suburbs Radio Club, and the Melbourne University Radio and Electronics Club.

He went on to become a member of the committee of the WSRC in 1974, Victorian Division Broadcast Committee Chairman in 1975, President of the Royal Melbourne Institute of Technology Amateur Radio Club in 1976 and was elected to the Victorian Division Council in 1977.

In 1976 Graham gained his Associate Diploma of Engineering (Communications) and Bachelor of Engineering in 1978, the same year he was admitted as a member of the IREE.

Graham's abilities as an organiser, an engineer, and as an amateur operator were well known. His design skills were notable for ingenuity and awareness of the state of the art, both in amateur and professional circles.

The lasting impression that he left with many of us was his ability to inspire those around him. For one in his early twenties he was able to enliven people at both ends of the age spectrum with his drive, knowledge, technical abilities, and his diverse interests.

Personally, Graham and I were somewhat complementary to each other. He influenced me in the fields of amateur radio, good wine, and as a small scale entrepreneur. Conversely, I introduced him to snow skiing and flying.

Graham was well known socially for his vibrant nature. While often being provocative he also offered direction and stimulus to others around him.

Professionally Graham worked for the Government Aircraft Factories (now Aero Space Technologies of Australia) before taking up a position with the Department of Science at the balloon launching station at Mildura in North West Victoria during 1979. This task had much to offer and was also one that Graham could contribute to enormously.

On the afternoon of 6 March 1979 Graham took his first flying lesson at the Mildura airport adjacent to his place of employment.

After this lesson he accepted a lift home with a colleague but was involved in a motor accident not far from the aerodrome which resulted in his death at about 1800 hrs. Aged 24 years.

This tragedy was not just the loss of the youngest son of Reg and Joan Clements, but one of Amateur Radio's exceptional members.

Many will read this on the tenth anniversary of his passing with fond memories of the many enjoyable events that they experienced with Graham and the inspiration that he was able to produce.

The WIA and the amateur population in general along with his family and friends have lost greatly by his untimely passing, but are all the richer for having known him.

I began to assemble a list of callsigns whose holders, I knew, had associated with Graham, but, predictably, the list grew too long to publish here.

One can only speculate what Graham would be doing for amateur radio and his profession if he were here today.

ar

BACKGROUND

WIA 1989 Packet Radio Position Paper

The WIA has had a considerable involvement in the formulation of packet radio policy within Australia. The activities, policy papers, Federal Council resolutions, meetings, WIA papers to IARU Region 3 and submissions to DOTC can be summarised, roughly in chronological order as follows:

FTAC Packet Radio Paper, adopted by the 1986 Federal Convention.

FTAC Band Plans Paper, adopted by the 1986 Federal Convention.

Federal Council resolutions on the proliferation of HF BBS.

Federal Council resolution on packet radio protocols: AX25 not to be the only one.

IARU Region 3 Seoul 1988 Conference packet radio frequency issues.

Sysops meeting Brisbane Sept 88 - Code of Ethics proposed.

Third Party Traffic definitions - ongoing discussions andcorrespondence with DOTC.

IARU Region 3 Conference Seoul Oct 88 - Report of Packet Radio Working Group (WG 1-P).

The list above sets out the evolving nature of packet radio, which has been accompanied by a number of frustrations and several incomplete actions that require resolution and agreement by the Australian radio amateur community.

NEW!! MAGNIFICENT from AOR

the 21st Century communications receiver

AR3000

Featuring:
Coverage
100 KHz - 2.036 GHz
Modes
NFM, WFM, AM, SSB CW
Memory
400 Memory channels
Scanning Rate
20 channels/second
Tuning Rate
50hz - 100hz selectable

NEW from the ICOM stable

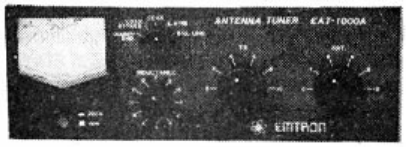
The fantastic budget priced **IC725**

TERRIFIC TRANSCEIVER
TERRIFIC PRICE: ONLY $1550

KENWOOD

Full range of all kenwood products available at competitive prices from our 3 stores

NEW 1KW EMTRON TUNER
EAT-1000A Only $549



This new EAT-1000/A is EMTRON'S latest antenna tuner built on special request by many amateurs. Built with finest components available, 5 position internal antenna switch, cross needle SWR/power meter, built in 3:1 balun for open feedline and antenna terminals for coax line, open feedline as well as longwire. EAT-1000A will tune almost everything from 1.8 to 30 MHz. At lowest price professional design and quality that EMTRON provides. MADE IN AUST.

NEW 300W EMTRON TUNER
EAT-300A Only $349

The finest 300 watt antenna tuner on the market with quality that only EMTRON can provide! Unique features such as:
• Cross needle SW 12/forward & reverse power meter • Built-in 100 watt dummy load • Antenna switch including bypass • Built-in 1:4 balun for open feedline • Lowest price & professional design • Matches everything from 1.8-30 MHz • Made in Australia by Emtron

OVER 1000 FAMOUS EAT-300 SOLD

EMTRON'S fastest selling 300 watt antenna tuner with SWR meter, built-in 1:4 balun, heavy duty ceramic switch and top grade components. Works with all rigs and is found in Amateur, Commercial and Marine services.

Only $239

THPLinear Amplifiers

Two Metres	was	now
• HL 180 V Auto 170W	$599	$489
• HL1103/10w-120w	$479	$429
• HL 110V/25 25-120w	$449	$399
Seventy Centimetres		
• HL 130U Auto 120 w	$799	$749

KENPRO ROTATORS

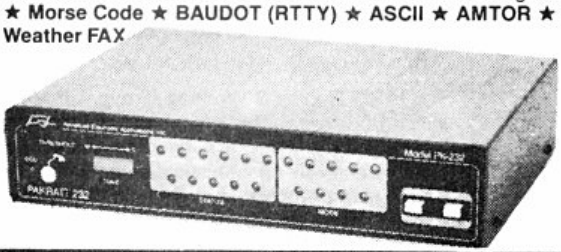
MODEL	BRAKING	ROTATING	PRICE
KR400	1530kg	400kg/cm	$369
KR400RC	1500kg/cm	400kg/cm	$429
KR800	4000kg/cm	800kg/cm	$659
KR2000	10,000 kg/cm	2000 kg/cm	$1299

All units include both top and bottom clamps, 8 core rotator cable available

JOIN THE PACKET REVOLUTION!

New PK-232 Breakthrough

A new software enhancement makes the AEA PK-232 the only amateur data controller to offer six transmit/receive modes in a single unit.
★ Morse Code ★ BAUDOT (RTTY) ★ ASCII ★ AMTOR ★ Packet ★ Weather FAX



PRICE $649 WITH FAX

NEW PK-88 ™ PACKET CONTROLLER NOW $299

The PK-88 is not just another copy, it is much more. With all the packet program features of the Multi mode PK-232, the PK-88 is an economical new TNC designed to bring you enhanced completely compatible packet software plus new hardware features for improved packet operation.

BANKCARD MASTERCARD & VISA WELCOME

EMTRONICS

MAIL ORDERS WELCOME

NSW & HEAD OFFICE:
92-94 Wentworth Ave, Sydney
NSW. 2000. TLX:AA73990
P.O. Box K21 Haymarket, NSW. 2000
Ph: (02) 211 0988
FAX: (02) 281 1508

VICTORIA:
288-294 Queen St, Melbourne
Vic. 3000
Entrance from Lt. Lonsdale St.
Ph: (03) 670 8551 or 670 0330
FAX: (03) 670 0671

QUEENSLAND:
416 Logan Road, Stones Corner
Qld. 4120
Ph: (07) 394 2555
FAX: (07) 394 4316

Aim

The aim of this paper is to provide an up-to-date position for agreement at the 1989 Federal Convention in order to assist the future planning of packet in the short term.

Considerations

In elaborating on the issues which need to be considered in order to reach an agreed position for future planning of packet in the short term, it is useful to use the items identified in the recent IARU Region 3 Report of Packet Radio Working Group (WG 1-P) and further more to consider them in the order discussed in that report. (See Amateur Radio magazine Jan 89 for the Seoul reports).

The paper limits itself to the short term, for with an evolving mode like packet it is impossible to predict far into the future. What was impossible yesterday may well be achievable on only one or two VLSI chips next year, further more planning is often constrained or directed by regulatory factors which can be changed by representations with convincing arguments to the controlling authorities.

Technical Developments

At Seoul, Working Group 1-P identified a number of technical activities which warranted further investigation by packet researchers and developers. These were attached as an Annex to their report which has been published in Amateur Radio magazine January 1989. These activities, whilst providing guidance, also pose a dilemma for packet. For on the one hand standards are being proposed, eg AX25 was adopted at Region 3 Auckland 85 as the preferred protocol, yet now we are saying "keep the options open" but still intercommunicate and advance the mode!

Bandplans

The FTAC Band Plans paper of 1986 made some provisions for packet frequencies, more by providing band segments for emissions of differing occupied bandwidths rather than by mode specific allocations as has been done in some nations. Since amateur radio band planning in Australia is by "Gentlemans Agreement" rather than by regulation, and considering the increasing emphasis upon de-regulation, FTAC was guided to propose band plans which showed consideration of all anticipated radio amateurs requirements as well as be generally acceptable to all amateurs, members of the national society or not. FTAC was also mindful that band plans were to be dynamic, in an evolutionary manner and would require relatively minor adjustments every few years. Indeed this has come to pass with a FTAC paper to the 1989 Federal Convention updating the Australian band plans in the light of IARU Region 3 Seoul 88. (See Amateur Radio magazine January 1989). Naturally that update includes packet considerations, also arising from Seoul 88.

The IARU Region 3 Seoul 88 Report from Working Group 1 - Band Plans has also been published in Amateur Radio magazine for January 1989 and need only be highlighted here. A point of interest is the review by BACKGROUNDGroup 1 of the need for wider data mode segments within the band plans to accommodate the growth in data modes in recent years. The inability of packet to coexist with RTTY and AMTOR led to a recommendation to extend the data segment on 14MHz upwards above the time shared beacon frequency of 14.100MHz (+/- 500 Hz guard band) to 14.112MHz and to recommend other data modes including packet operate in this extension. Recommendations were also made for the 7 and 10MHz Auckland 1985 Region 3 Conference plans, plans which were adopted by the 1986 Federal Convention for Australia.

Turning to the VHF and UHF bands, provision has been made in the channelised segments for a number of FM packet channels. These are available with adequate frequency separation to permit co-siting of transceivers operating in the same frequency bands. Where packet requires wider bandwidth channels than presently anticipated, operation is still possible in the all mode segments identified in each band plan. What is important is to select frequencies wisely in the first place, taking into consideration all factors, then that selection will be satisfactory for a number of years without causing difficulties for others. (The days of using any available crystal are long gone!)

Third Party Traffic

Third party traffic considerations have raised more than their fair share of problems with packet. Some of this has been occasioned by a tfatalistic desire by some individuals to seek rulings from the authorities. Pursuit of such a ruling, knowing that it will have a high probability of being adverse, is not the sensible way to approach the matter. Sadly these supposedly well intentioned, but completely misguided, individual actions have been lauded to all as progress because "the issue HAD to be clarified".

An outcome of these machinations has been an apparent hardening on the part of the authorities to maintain a decision made, in our opinion, in haste and without consideration of all the factors, by relatively junior officers. Consequently we are faced with a literal dictionary interpretation of third party which makes the Australian amateur's circumstances as constrained as any in the world, including the USA which has some forty bilateral third party agreements in place to ease the pressure. Ironically the authorities have chosen not to rule traffic via an amateur satellite within their definition, no doubt because of the difficulty of disciplining the satellite!

At Region 3 Seoul 88, Working Group 2 recognised this constraint on amateur communications and saw three possible avenues open to national societies. Firstly to make representations to the national authorities to permit the retransmission of information received from other amateur stations and that such reception and retransmission of amateur originated information be not treated as third party traffic as referred to in para 2733 of the Radio Regulations. Secondly, IARU member societies could press their national authorities to include a definition of "Third Party" fro the Amateur Sevice in the Radio Regulations. Or thirdly IARU member societies could press their national authorities to review Article 32 and amend 2733 to permit third party traffic where the third party is a licensed amateur.

It is recommended the WIA follow the Region 3 guidance above.

Bulletin Boards

There are three matters worthy of consideration when examining bulletin boards, these are:

The availability and purposes of VHF/UHF bulletin boards, devoted primarily to providing end user connections.

The proliferation of HF bulletin boards, devoted primarily to bulletin and message forwarding.

A Code of Ethics for bulletin board Systems Operators (Sysops).

Whilst it is acknowledged VHF/UHF BBS provide the end connection to most users, a balance must be struck between a proliferation of auto forwarding BBS all carrying the same messages and occupying several frequencies or one BBS with the attendant difficulties and delays in gaining access or perhaps one general BBS supplemented by one or more specialist BBS with appropriately restricted contents. It is the feeling of the packet community that this last named option is preferred in major cities. Fortunately we are spared the international co-ordination problems of some of our regional neighbouring societies.

Region 3 Seoul 88 recognised the difficulties with the proliferation of HF BBS and recommended they be co-ordinated for orderly growth and be limited to the minimum number necessary. In Australia this equates to one per geographically smaller state and two (maybe three), suitably dispersed, for the larger states.

Concerns have been expressed at the proliferation of bulletins of questionable worth, eg junk mail or outside the BBS operator's license conditions, eg advertisements or indecent or profane text or even third party messages. It has also been observed that one man's junk mail is another's finest thoughts! The Sysops meeting in Brisbane in Sept 88 identified these problems and proposed to write a Sysops Code of Ethics. That project needs to be taken to conclusion and the Code agreed and adopted by the Federal Council.

Access to the Packet Network

IARU Region 3 Working Group 1-P recognised the desirability of retaining a simple means of access to the packet network by new comers, using relatively unsophisticated stations. They saw interoperability of systems, through interfaces as necessary, as essential objectives of packet development. At first glance this appears to conflict with the experimental and developmental nature of packet, however, it is not necessary or even desirable to provide this newcomer access at a high performance level. New devotees will be induced to upgrade their stations to take advantage of the bigger and better "bells and whistles" as they come on line, offering off their initial modest equipment to further new comers to the mode.

The development of networks and testing of

advanced protocols should not be inhibited, but rather run in parallel and be as transparent as possible to the mature data handling system.

For both networks and protocols, the role of the WIA should remain one of co-ordination, information dissemination and liaison with the national authorities, leaving the development of hardware and software to the specialist user groups involved.

Conclusions

Packet radio has reached the stage in its development where the guidance previously given by the Federal Council of the WIA should be revised. In the light of recent IARU REgion 3 developments the way ahead has been defined for the next evolution in its advancement.

Recommendations

It is recommended the Federal Council:

ENDORSE the changes made to the Australian band plans to update them and to accommodate the increasing demands for data mode spectrum.

ENDORSE the proposal that the WIA follow IARU Region 3 guidance in its approach to the national authorities for less onerous third party traffic operating conditions.

NOTE the areas of technology identified by IARU Region 3 for consideration in the development of packet and ENCOURAGE their pursuit by Australian enthusiasts.

ENDORSE the concept of one general purpose VHF/UHF bulletin board together with one or more special purpose limited topic boards in major cities.

ENDORSE the concept of limiting the number of HF bulletin boards to the minimum number necessary, taking as guidance one in each geographically smaller state and two in larger states.

ENDORSE the concept of a Sysops Code of Ethics and ENCOURAGE the active HF Sysops to complete that Code.

NOTE the desirability of retaining simple access to packet networks using unsophisticated stations with interfacing as necessary to permit use of most network facilities. OBSERVE that parallel development can proceed and acess to more facilities and faster system operations will be an inducement for newcomers to upgrade their stations.

Federal Technical Advisory Committee
Version 2 31 Jan 89
ar

HOW'S DX?

Stations worked

Stephen Pall VK2PS
PO Box 93
Dural 2158

Interesting DX QSOs on the East Coast during December 1988 and early January 1989. Alll contacts SSB

14MHZ

IM0GSA - Alfred on San Antioco Island, South West of Sardinia.

FM5WE - Guy on Martinique Island. QSL to call book address.

A4XKJ Siddiq in Muscat. QSL to call book address. Incidentally the Sultanate of Oman has changed prefix from A4X to A41 for the local Omani stations.

C56/F2CW - Jackie in Gambia - QSL to F2CW call book address.

EP2HZ - Hassan - QSL to PO Box 16765 3133 Teheran, Iran

GD4RAG - John in Port St Mary Isle of Man.

C31SD - Carlos in Andorra- QSL via Buro or to CT1AMK.

HK1ADM - Oscar in Colombia. QSL to PO Box 6149 Cartagena, Colombia.

NQ6X/SV5 - Bob on Rhodes. QSL to home QTH

VK0GC - Graeme on Macquarie Island. QSL to VK9NS.

CO2HT - Pedro in Havana.

YN3CB - Carlos - PO Box 3733, Managua, Nicaragua.

CU3AE - Jose in Angra, Azores. PO Box 157, Zip 9700, Azores.

KC6JC - Cav in East Carolines. QSL to call book address.

ZP5XDK - Tony in Asuncion, Uruguay.

4F6PC - Cris on Negros Island, Philippines. According to Cris this is the new prefix for The DU "Extra Class" Licence.

5Z4LL - Christine in Nairobi, Kenya. QSL to callbook address.

JX1UG - Ivar on Jan Mayen Island. QSL to LA5NM.

3D2RP - Ruven on Vanua Levu Island, PO Box 1267 Labassa, Fiji.

VK9ZM - Mellish Reef DX - Expedition. QSL to NM2L.

3D2HO - Hamish visiting Fiji. QSL to G0GLJ.

9M8PV - Andy in Sarawak. QSL to call book address.

C6ANI - Ric, Bahamas. QSL to callbook address.

ZL7TZ - Tai on Chatham Island. QSL via Bureau.

LY2ZO - QSL to UP1BZO.

YL2VZ - QSL to UQZGM.

OD5TS - Anthony. QSL to PO Box 175, 124 Beirut, Lebanon.

21MHz

GU3EJL - Stan on Alderney Island. QSL via Bureau.

8Q7MT - Masa in Male in Maldive Islands - QSL to JI1DBQ.

28MHz

About a dozen European Countries, among them U1AU, EA6XN.

Heard the following on 14MHz:

A35SK, QSL to SM5CQT - A35MJ QSL to KS7D.

IK2GNW/KH8 Adriano Active on American Samoa

How would you like to have an antenna tower erected

in the West German State of Baden Wurtemberg?

Easy! You do not have to have a permit if your tower is not higher than 10 metres above ground or the roofline!

Quite sensible I think.

Further DX Activity

From Bob Demkiw VK2ENU
18 Ettalong Place
Woodbine 2560

On 5th January, 1989, I worked Ian VE3IEO/MM on 20 metres who was somewhere in the Coral Sea and on his way to Mellish Reef. By now it is well known that Mellish Reef, VK9ZM, was activated and it was intended to activate Willis Island, VK9ZW, however, I do not know if this was achieved as that call was not heard at this QTH even though the designated frequencies were monitored.

I do believe, however, that more than 20,000 contacts were made with VK9ZM (this figure was announced on the 222 Net). The QSL manager for both of these stations is NM2L.

I have been advised by Joseph Petruff, 7J1ADJ, that he will be operating from Iwo Jima Island during the period 22nd - 29th March, 1989, and signing as either KA2IJ/JD1 or 7J1ADJ/JD1.

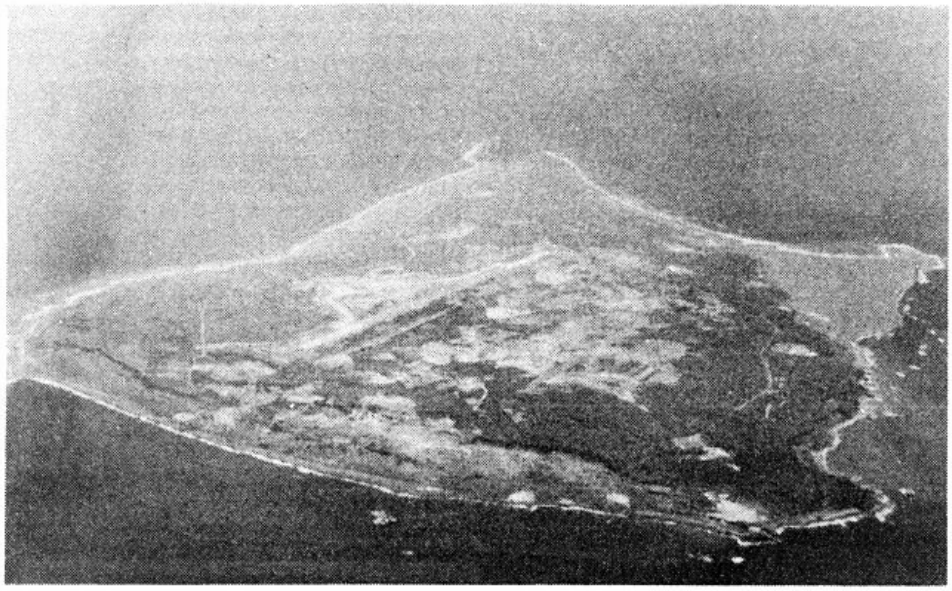
Iwo Jima Island is in the Ogasawara Group of islands located to the south of Japan and I understand that there are no licensed amateur radio operators in the island group at the present time, although there are people studying for their licences.

The QSL manager for Joseph is KB1BE. I enclose a photograph of Iwo Jima which you may be able to publish.

On 22nd January, 1989, the Liberian Amateur Radio League operated a special station, EL2LMP/40, to mark the 40th anniversary of the Liberian Maritime Program. QSLs should be sent direct to the Liberian ARL.

Stations heard/worked in January, 1989, as follows:

DATE	TIME	BAND	STATION	QSL INFORMATION
02-01	0557	20	ZL0ADL (Heard)	HB9KNA
	0758		12SM	
03-01	0738		A35SK (Heard)	SM5CQT
	0750		CU2AK	J.A. Vasconcelos Raposo. R Ernesto do Canto 74-S, S Pedro, Ponta Delganda,
05-01	0705		VE3IEO/MM	NM2L
	0847		ZL2BAQ	
07-01	0947		BY4SZ	PO Box 51, Suzhou, China
10-01	0336		VK3DUO	
14-01	0908		CU2AK	
	1023		7J1ADJ	KB1BE
	1044		VK9ZM	NM2L
	1153		WH6CBB	
	1207		VK9LA	DJ5CQ
15-01	0816		VK6HQ	
	0914		VS6DO	WA3HUP
16-01	1302		W3MJF	
19-01	1152		HK1HHX	N4ENS
20-01	1228		UJ8JMM (Heard)	
	1236		A41KJ (heard)	PO Box 741, Masquat, Oman
21-01	0823		EL2E (Heard)	PO Box 136, Lafoa, New Caledonia
	0804		KC4USR	N5ETL
	0818		CQ8LN	CT1LN
0829	EA3FAH			
0909	G4SDP			
	0915		VK6QG	
31-01	0952		KK4WW	



Aerial view of Iwo Jima

AMSAT

New Columnist

Maurie Hooper VK5EA
11 Richmond Rd
Newton 5074
National Coordinator
Graham Ratcliff VK5AGR

Information Nets
AMSAT AUSTRALIA
Control: VK5AGR
Amateur check in: 0945 UTC Sunday
Bulletin commences: 1000 UTC

Primary frequency: 3.685 MHz
Secondary frequency: 7.064 MHz
AMSAT SW PACIFIC
2200 UTC Saturday, 14.282 MHz

Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia net. This information is also included on some WIA Divisional Broadcasts.

Thanks...

As you would have noticed in the February issue, Colin Hurst VK5HI has relinquished the job as AMSAT Australia columnist after six years' service. Thank you Colin, on behalf of all our readers, for a job well done.

I will endeavour to continue in providing a column of both topical and "historical" content, and will be pleased to receive reader feedback.

The following is the first part of a document describing the Microsat programme

THE FIRST FLOCK OF MICROSATS
COURTNEY DUNCAN, N5BF
JAN KING, W3GEY
11 January, 1989

This paper is derived from a series of four MICROSAT technical overview proposals given to four different organisations, buyers of the first four MICROSATS. It is prepared at the request of Mr Doug Loughmiller, President of the North American Radio Amateur Satellite organisation (AMSAT-NA) in order that prospective users of MICROSATS and other interested parties may be apprised of the capabilities of and intentions for this class of spacecraft.

Introduction

The names of the first group of MICROSATS are currently specified as follows:

Pre-Launch	After Launch	Organisation	Leader
MICROSAT-A	DOVE-OSCAR-XX	BRAMSAT	Junior T. DeCastro
MICROSAT-B	LUSAT-OSCAR-XX	AMSAT-LU	Carlos Huertas
MICROSAT-C	PACSAT-OSCAR-XX	AMSAT-NA	Doug Loughmiller
MICROSAT-D	WEBERSAT-OSCAR-XX	CAST	Robert Twiggs

Each "XX" designator will be replaced with the appropriate OSCAR number upon successful deployment on orbit. BRAMSAT is the Brazilian Amateur Radio Satellite organisation, MASAT-LU is the Argentinean Amateur Radio Satellite organisation, AMSAT-NA is the North American Amateur Radio Satellite organisation, and CAST is the Centre for AeroSpace Technology, Weber State College, Ogden, Utah.

In addition, significant volunteer and financial support are provided by the American Radio Relay League and the Tucson Amateur Packet Radio Corporation.

This paper details the feasibility, technologies, costs, and schedule associated with the MICROSAT project in its first four implementations.

Mission Goals

The respective missions are as follows:

DOVE - Provision of an easily received signal consisting of a voice modulated beacon for educational and scientific use. Planned uses include transmission of current telemetry and of amateur radio bulletins and messages in sveral languages.

LUSAT - Demonstration of radio amateur commitment to extending digital communications facilities fully into the Amateur Satellite Service; provision of an easily utilised, satellite based facility for data storage and forwarding using amateur packet radio techniques; and a demonstration of the feasibility of digital store-and-forward facilities within the amateur radio environment for educational and scientific purposes.

PACSAT - Essentially the same goals as LUSAT. PACSAT has the additional goal of research and experimentation with specialised protocols for efficient access and utilisation of digital data satellites.

WEBERSAT - Provision of an easily utilised, satellite based facility for video data acquisition and storage and transmission to amateur radio ground stations using amateur packet radio techniques

All of the missions share these common goals:

1) A demonstration to the International Telecommunications Union (ITU) that amateurs from each organisation involved have a strong interest in the use of the radio frequencies allocated to the Amateur Satellite Service for the improvement of amateur practices and in supporting the international amateur satellite community.
2. Provision of a test bed for evaluation and validation of hardware technologies and software to be employed.
3. Provision for advanced utilisation of the spectrum allocated to radio amateurs by the regulating authorities of the various countries involved and the International Telecommunications Union.

All of the missions share these common constraints:

1. The cost of the satellite and ground station equipment is to be minimised.
2. The mass and size of the satellite are to be minimised in anticipation that one means of launch could be man-assisted and recognising that many launch opportunities are potentially available for small, lightweight satellite packages.
3. The mission will build on user equipment, techniques, and capabilities already utilised in the Amateur Satellite Service for digital or voice communications wherever possible. The costs of ground station construction or modification are to be minimised.

de Maurie VK5EA
ar

VHF/UHF – AN EXPANDING WORLD

Busy on six

Eric Jamieson VK5LP
9 West Terrace
Meningie 5264

Times are Universal Co-ordinated Time and indicated as UTC

The Beacon List

For the first time in many years the list of beacons is not included. It has been deleted to conform to new printing arrangements for AR needing at least 20% reduction in material from all contributors, to permit larger print size.

My report for the March issue is normally larger because the summer Es period leads to increased VHF activity. To avoid depriving readers of vital information, I have removed the beacon list - they were fully listed last month and there have been no changes - to devote the space saved to band activities. It will also give me some idea how much pruning I have achieved. The beacon list will be back next month!

Six Metres

The six metre band is still in the news. Following the excellent conditions through September/October and into early November resulting in many TEP and F2 contacts to Japan and the USA in particular, (at least in VK1, 2, 3 and 4), the change to Es contacts with the approach of summer kept the band alive. Of particular interest were the contacts being made occasionally to Japan and to the USA, no doubt being assisted by Es. The solar flux remained close to 250 for several days around Christmas and averaged above 200 for December - little wonder exotic contacts were being made.

24/12: At 0755 Steve VK30T worked P29PL and P29ZJS, the latter reporting he was going to operate from 3D2 for one year. Phil VS6CT would be going to XX9 Macao soon. Steve said the best way to work a BY station would be to try and have him shift from 15 or 20 metres to six metres. Suggested BY1PK, BY4RV and BY5AA were likely contenders. Steve also is QSL Manager for VK9YQS/O at Macquarie Island and asks for a SASE for a QSL.

On 26/12 at 0956 the Perth beacons, VK6RPH on 50.066 and 52.460, were checked by VK5LP and the 50 MHz beacon found to be slightly stronger. This sort of test will not be meaningful until the beacons radiate the same power from a common antenna.

27/12: 0004 VK4JH to VK2XNK, followed by VK4FXX working ZLs. Lloyd said later that at 0345 TV from China had been into Townsville. He also heard JA2IGY and JA7ZMA beacons. Called CQ JA and FK1TS replied, signals were up to S9 for an hour. VK30T heard a station in AH5. At 0900 the band opened to Japan with JA1, 7, 9 and 0 being worked, plus HL9ASH.

On 28/12 at 0357 I worked Graham VK1BGG who reported hearing W6JRA weakly at 0153. During this time ZLs were working W6. FK1TS worked VK5NC and VK3LK. At 0630 on 29/12 the band opened to ZL3ADT, ZL3TIB both 5x9, others at varying signal strengths. Earlier in the day ZL3 had been working VK2 on two metres. ZLs had been working FK, KH6, HL and JAs, and ZL3NE worked five Ws.

30/12: The band opened early around 0030 to VK6KXW and VK6BE, then swung around to VK8ZCU (Tennant Creek) at 0100, a few minutes later to VK4KJL who said he had worked ZL3NE at 0147. At 0313 VK4ZAZ worked Henri FK8EB, then VK5BC. FM signals from FK (96 MHz) were copied in VK4. At 0430 VK5 stations were given a treat in working KH6IAA, KH6FOO, KH6JJI, KH6HI and others, all with S9 signals lasting for half an hour, in fact, signals were so good that VK5LP was receiving 5x9 reports with a power output of ten watts! At 0500 VK6BE, VK6WD and possibly others worked KH6IAA and heard FK1TS. So did VK8ZLX.

31/12: The band seemed quiet at VK5LP, at least up to 0000 hours, so I agreed to take the three teenage boys fishing in the Coorong. They caught enough for a meal and had a good day. At 1000 I was informed by Roger VK5NY that during my absence the band had opened to the US and VK2, 3, 4 and 5 had worked W5FF and others. Roger worked W5FF at 0214 when he was 5x5 and heard WA7CJO. W5FF apparently worked 23 stations in VK. KH6GFF was 5x7. Roger said there had been an X1 flare giving a solar count of 180. VK5NC worked W, and KH6 went into VK6 and VK8 again; Peter VK8ZLX worked K6MYC/KH6 and heard VK9NS. Ah well. The fish were good eating despite my remorse! Of course the Ws did not return the next day and neither did the boys want to go fishing!

On 1/1/89 an early opening around 0000 to ZL2TPY and several others. Kerry said VK2 were working ZL on two metres and some Ws on six metres. ZL2BGJ had set a new world record for EME by working WA4NJP but no details. On 2/1 strong signals from VK7 with VK7WD worked just before 0000. Then over to ZL2AJI who reported it had been open between ZL and W and XE. News came in that VK1BGG had worked N6, K6 and heard K7. Peter, VK8ZLX worked P29PL and KH6HI and heard the H44HIR beacon. Open from 0400 from VK4FNQ to W, VK4FXX and VK4BRG to KH6. At 0715 Steve VK4KHQ at Mount Isa worked VK8ZWM and VK8RH in Darwin at 5x6. Lyn VK4ALM in Rockhampton said he had worked five countries on this day, VK, P29, KG6, KH6 and JA8!

3/1: At 0000 ZL to VK3, 4, and 5. Norm VK3DUT worked ZL1, 2, 3 and 4 also VK9YQZ/O on Macquarie Island. JAs had worked ZL4 which was rare. VK4FXX and others working JA9. At 0925 VK8ZCU from Tennant Creek 5x9, then VK8ZLX 5x9 at 0945. Lyn VK4ALM making another appearance at 1015.

4/1 dawned with appearances of being a good day. Band open to VK2 and VK4 before 0000, VK3 were strong on backscatter and VK4

were working VK7. VK8 from Alice Springs were strong around 0900. Soon after VK8ZLX and VK8KTM were working VK5 and VK3 on two metres, Peter VK8ZLX started at Meningie at S3 then rose to S9 for a few minutes. Peter said he worked VK3DUT, 3APW, 3AIH, 5ZRK, 5ZRO, 5NC, 5ZDR and 5LP. Plenty of VK4s most of the day on six metres.

5/1: Relatively quiet until 0300 when VK6AOM came in, followed by VK2HT. Neville reported the Newcastle repeater on 52.625 was operational with 25 watts, soon to be raised to 80 watts, using crossed dipoles and situated 300 metres asl. VK6 then started working VK2. Hughie VK5BC worked a W6 this day. H44HIR beacon to VK5NY and VK5LP at 0400. About this time VK6KXW, 6YU, 6ZRY worked at 5x9. Roger VK5NY reported working VK8XX at 1430 UTC (that's 1am local time!) at 5x9. Roger said many of the eastern States beacons were audible at the time.

6/1: 0155 VK5BC and others to VK4FXX. 7/1: VK6KXW said everything was quiet. It certainly was, only the odd contact to VK3 and VK4. 0722 VK6BE 5x9. Hugh VK5BC making good use of CW for rustling up contacts. 12/1: VK2MZ working VK3 and VK7 at 2300, then VK6YU. 13/1: 0143 VK4DM worked VK1VP, then VK4PU. 0325 observed VK4KK, 4ZAL, 4ZNC working VK9ZM on Mellish Reef on 52.050, no sign of VK9ZM here. Open to VK4JH at 0615 at VK4KIT at Mount Isa at 0713 to VK5ZDR, 5AIM and 5LP.

15/1: 52.050 - 0315 VK4s working VK9NS. At 0330 VK9ZM to VK4ZMI, 4ZAL, 4ZJB, 4PU, 4VC, 4APG/M, 4KU, 4KJL and others, signals from S1 to S9. Also to VK7HL, 7KMR, at 0347 to VK2QF and northern VK2. 0430 Raj 3D2ER worked VK4KU, 4KJL, 4ZMI, 4ZJB, 4ZAL, 4PU, 4ZNC, 4ZAZ and others. As John VK4ZJB/VK4KK commented in his letter it was quite an eventful Sunday afternoon. Around 0930 he observed swarms of JAs presumably working VK9ZM on 50.110.

Also on 15/1 the east coast positively buzzed with excitement at the reported contact between John VK4TL in Cairns and G2BHI at 1000 UTC on six metres. Ever wary, I personally phoned John and asked for details. John asid a CW contact took place but he had doubts as to its authenticity as contact with Gs later on 10 metres revealed no listing of that callsign, it was either a new station or a hoax. John said he was beaming to the US at the time and G2 would be at right angles to his antenna. There was no doubt about the call sign as he has operated on CW since 1951, but the signal reports of 559 both ways and the reluctance of the other operator to give his name or location casts doubt on the contact. John stressed that under the circumstances, he was not promulgating the contact as having been authentic. If a QSL arrives then the matter can be decided at that time.

On 16/1 open to VK2 and 4 during day. On 18/1 VK3AUU and VK3AKK worked 3D2ER. VK8ZLX at 1010, VK8ZMA was 5x9 at 1021, said Channel 3 TV noted in Alice Springs. At 2338 short skip to VK3 with VK3AUU, 3DUQ and others 5x9. 19/1: VK7RST and VK7RNT beacons audible in Meningie most of day, then at 1020 VK7RMC two metre beacon strong - still no takers!

20/1: This was to turn out a great day. VK5LP and others worked all States on six metres! Started off at 0001 to VK7JG, then to VK4ALM at 0030, followed by VK2 and 3, 0120 to VK1BGG, VK6BE and 6ATF, to VK8 at 0030, and again at 2333.

Open again to Ray VK3LK and Steve VK3OT at 1200. Steve was a particularly good contact which lasted for some time.

21/1: 0039 VK8ZCU 5x9. Neil, from Tennant Creek, was a consistent contact this year. 0110 to VK4DO who was working ZLs. Wally said he had recently returned from a trip to China and had visited their amateur radio club in Beijing. He said there appeared to be one station set up for six metres, BY1PK. 0140 VK4FNQ. 0425 John VK4KK phoned to say he had just worked VK9ZM on Mellish Reef at 5x9, others were VK4ZAL, 4ZNC, 4KJL and 4AHW. Others included VK3s and VK7s; all were now hoping to work VK9ZW from Willis Island. 0530 VK4ALM. 26/1 VK4VV on CW, 0100 VK6KXW 5x9.

Panama worked

25/1: At 0216 Neville VK4ZNC worked HP3XUH of Panama with signals 5x5 both ways. The opening lasted for 15 minutes according to the message from John VK4KK. That's a rather spectacular contact and one of the best so far for Cycle 22. It is thought VK3AMZ may have worked him, not certain about any others.

25/1 was obviously a very good day for the eastern States. At 1200 Steve VK3OT heard with some difficulty, XX9KA from Macao at 3x1. At the time the JAs were working VK7 and Asian TV was very strong, including Thailand TV on 55 MHz, and many remote areas video signals were audible. AT 1305 video was available from G land, at 1310 he copied 9H1SIX from Malta. Steve said it was likely 8Q7 in the Maldives would be activated in March. 28/1: open to VK2 several times including 0914 to VK1VP, 0918 to VK2BFQ and VK2BHO.

News from Brunei

The above is a summary as I saw things at VK5LP. Following is a precis of the contents of various letters which arrived this month. Mindful of my reduced space the comments may seem terse but with so much to report this is necessary.

I have two letters from Andrew Davis V85DA (VK1DA) from Brunei. The first was dated 25/10/88 and was somehow overlooked. Using a TS600 and 10 watts on 20/10 he worked 130 JAs between 0700 and 0900, including 30 plus on CW. AT 0902 he worked HL2ASH. On 21/10 Andrew worked 60 JAs up to 1700 UTC (1am local) and 20 JAs on 24/10. He heard JAs working to VK6 but no sign of VK6. He is quite happy to work JAs on CW when conditions are poor, but believes 20 wpm to VK would be wasted! Andrew hopes to run 100 watts eventually.

Andrew says there is a two metre repeater in Sabah, on Mt Kinabalu, also a TV sound carrier on 53.750 MHz which could act as as good beacon for VK. However, this same channel precludes six metre operating from the Brunei capital, Bandar Seri Begawan. Fortunately, Andrew is at the south-western end of the 100km long country. A two metre repeater for the capital is under consideration, but mobile and portable operation is prohibited.

Andrew's later letter is dated 22/12/88 and sent from Canberra during his Christmas break. It includes a computer printout of his 340 or so JA contacts made on eight operating days from 20/10 to 13/11. He normally checks JA and VK beacons and VK/ZL TV sound each day but is not always able to operate due to various commitments. The JA beacons vary from S1 to S5, rarely stronger even during a good opening.

Andrew will return to Brunei with a 60 watt amplifier, a rotator and with thoughts on how to vary his HF antennas to accommodate VHF! He reports local interest in six metres has increased since he came on. V85GA has a transverter but needs an antenna.

I did work someone on Brunei at least on two occasions during Cycle 21. If you need to contact Andrew, his QSL is Andrew Davis, V85DA, C/- FIC Dept, BSP Co, Seria 7082, Brunei. The longer way around is via PO Box 999, Woden 2606.

New Zealand

John, ZL3AUU enclosed details of beacons in ZL. On 2/1/89 he worked W6XJ, XE2GBO, N6XQ, WA6BYA, K6MYC, KH6JJI, KH6FOO, KH6JJK, KH6HI, JAONAE, JHOHZO, JHOBBE and FK1TK. He regularly hears six metre beacons from VK2, 3, 4 and 7, has also heard JA1IGY, H44HIR and KG6DX.

California

Bob WA6BYA (grid CM87) reports a very good six metre opening on 2/1 to VK and ZL when he worked 15 stations in ZL and the following between 0142 and 0318: VK1BGG, 1RX, VK2QF, VK3OT, 3AMZ, 3AUU, 3AKK and FK1TS. Others in his area that night to work stations were K6HCP, K6MYC and N6AMG. VK stations were also worked by N7ICW (Nevada) and NOLL (Kansas).

Mike K6MYC (grid CM97) on 2/1 between 0153 and 0335 worked VK1BGG, 1RX, 1KAG, VK2QF, 2BHO, 2AKK, VK3AUU, 3AMZ, 3OT, 3AUI, 3AJW, 3BDL, 3YY, 3NM, VK4AMK, 4FNQ, 4BRG, 4RO, VK5TAF (?) (best DX that night) and FK1VK. From K6MYC/KH6 on 31/13 from 0255 to 0324 he worked VK4BRG, 4RO, VK6KXW, 6HK, VK8GF, 8ZMA and 8ZLX.

New South Wales

Nev, VK2QF has upgraded his six metre antenna system to a pair of six elements of W6SAI design, 5/8 wavelength apart and set at 20 metres. It has survived storm and tempest but not the ravages of cockatoos who ate through the lower 75 ohm phasing harness. All coaxial cable is now in half-inch garden hose! When Es collapsed at the end of 1987 Nev missed working T20AR but could hear coastal stations working him.

Very little six metre activity until 8/9/88 when the band opened to JA8 etc. On 5/10 all JA districts except 7 and 8 plus HL5BAS. Japanese contacts were very consistent almost on a daily basis leading up to a very large opening on

22/10. Then 27/10 JA; 29/10 KH6HI; 30/10 KH6HI, JA; 31/10 WA6BYA at 0220 at 5x1 on SSB; no DX of any note through November/ December until 31/12 when told by VK2EMA that W6 and W7 had been heard to 0230. On 2/ 1/89 WA6BYA, K6MYC, KB3LY/6, K7KW, NOLL, N6AMG to S9 between 0200 and 0230. 4/1 H44HIR s9 0400.

So, like quite a few areas around the country, Es has not been plentiful this season at VK2QF, further evidence that we must be very close to the top of Cycle 22.

New Caledonia

Phill FK1TS, from Noumea writes that he experienced a good winter Es last July by working VK2,4, ZL1,2,3 and heard the H44 beacon. TEP contacts started 30/7/88 at 0744 to KH6; 1/8 0859 KH6, AH9; 6/8 0913 JA1,2,3,9; 7/8 0957 JA1,2,7; 8/8 0756 KH6; 9/ 8 0727 JA1,2,3,7,8,9,0; 11/8 0622 JA7.

From 15/8 to 31/10 he travelled with work commitments to KH8, 5W1, 3D2 and ZK1. As 3D2TS and with limited time he worked 160 JAs mostly on 15/9, KH6JJK on 14/9. Used an FT690 and 50 watt linear to a quarter-wave vertical. As ZK1XT at Arorangi, Rarotonga, in the Southern Cooks Group, the accommodation did not lend itself to operating - the only position for the antenna was taped to a wooden balcony! On 10/10 at 0131 he worked HL9CB and from 1037 about 60 JAs in JA2,3,4,5 and 6. He also heard JAs working a number of South American countries.

Back in New Caledonia on 1/11 from 0200 VK2QF, 2XJ; 0213 JA1,5,0, KH6 for 8 contacts; 2/11 0600 JAO, KH6 = 2; 3/11 0528 JA1,2,3,4,6,0 = 12; 4/11 0114 JA1,2,3,5,6,7,9,0 = 16; 6/11 0205 JA4 = 1; 11/11 0234 JA1,2 = 2; 12/11 0240 VK2,4 = 4; 0321 JA1,2,6,7 = 10; 13/11 0130 VK4KU; 15/11 2020 VK4KU, 4KJL = 2; 16/11 0522 JA1,2,0 = 4; 17/11 0650 VK2,4, JA1 = 4; 18/11 0300 JA6 = 1; 19/11 0255 JA1,2,3,4,5,6 = 10; 20/11 0244 JA1,4,7 = 3; 25/ 11 2320 ZL1,2 = 6; 26/11 0406 JA1,2,3,4,6,7,9,0 = 44; 2138 VK2,4,8,ZL2 = 35; 27/11 VK2,4 = 8.

Phill said that 1987 JA contacts stopped abruptly on 10/11, but in 1988 they were continuing right through November. In 1987 VK contacts did not start until 24/11 but in 1988 from 1/11 plus JA1 and KH6.

FK1TK worked three W6s on 19/9/88 but none since, but has observed ZLs working W6 and W7 with no sign in Noumea. Phil said he would be in Guam during March 1989.

Victoria

John VK3ZJC comments in his letter on the TV sound signals on the upper end of 51 MHz, saying they are very consistent this year, with the strongest and dirtiest signal being that from DDQ0 in Toowoomba, with S9 crud extending past 52.100 MHz (here in Meningie), for days on end. Small wonder the Brisbane amateurs were glad to lose that station - what it must be doing to other Channel 0 stations is anyone's guess!

Several VK6 stations have been reaching Melbourne with some regularity, mainly VK6AOM, 6KXW and 6AKT on 23/11 and 24/11 and VK6AOM again on 2/1 and 5/1. ZL contacts have not been frequent, in fact there have probably been more openings to JA. W6 and W7 have come in several times, the best being on 31/12 to N7BLS, K6FB, N6HBI and KB6SNC. John said the dogpiles were horrible! Melbourne stations have been working FK1TS, FK8EM and VK9NS , also Doug VK9YQS/O on Macquarie Island. Doug has a VK9 callsign because DOTC no longer issues VKO limited callsigns.

Gil VK3AUI sends some copies of SMIRK information. Included is the SMIRK Awards Programme and an application form to become a SMIRK member or extend your current membership with extra acknowledgements. At this stage Gil said he is prepared to provide a photocopy for SASE - if flooded with requests he may need to add a small photocopying charge - at the moment there is no charge. His address is: Gil Sones, VK3AUI, 30 Moore Street, Box Hill South, Victoria 3128.

Ray Clark, K5ZMS, of SMIRK, is seeking ideas regarding an International Award of Merit for six metres and would appreciate any ideas, either direct or they could go via Gil VK3AUI or VK5LP. Also, SMIRK has a deal with Worldradio for SMIRK members where $US25 pays SMIRK dues and a sub to Worldradio magazine.

Gil extracted a few points from the SMIRK newsletter: Holland has 50.0 to 50.45 MHz with 30 watts CW and an antenna gain limitation. Fred Simpson, VP8PTG is on six from the Falkland Islands. QSL via G4RFV. Finland has 50.0 to 50.5 MHz, 50 watts CW and 200 watts SSB, no antenna restrictions and 60 licences only for the present. Permits are slowly being issued in both France and Norway.

Due to space shortage this month further extracts from the SMIRK newsletter will appear next issue.

Japan

A massive list of stations worked by JAs appears in the November 1988 Japanese "ham radio" magazine, per courtesy Graham VK6ROO. Most are to VK4, but quite a list covering VK1,2,3,5,6 and 8 as well. Other areas/stations JAs have worked include 5W1GP, T20AA, P29ZEF, HL, KX6DS, H44GP, F05DR, 3D2TS, KX6BA, FK1TK, ZL1 to 4.

South Africa

"The ZS VHF News" for January 1989 reports ZS3E in northern Namibia has had contacts with US and Canadian stations. ZS6LN had a crossband contact with Finland, being the furthest north propagation was reported, while the longest tw-way contact completed from South Africa was to GM3WOJ in northern Scotland. With the solar flux above 200 for December European stations had almost daily openings to the east coast of the US and Canada, with frequent openings to the Caribbean and northern South America.

The South African Es season was an almost total washout with only a few ZS3 to southern South African contacts, with no short skip between ZS6 and ZSI/2. However, the South AFricans say that Cycle 21 produced ZS6 to KH6/JA/VK/ QS0s during April while North America to ZS peaked in November. Everything points to those expectations again and with more countries (over 120) now available the next two years should be exciting. Greece and Sweden are issuing operating permits allowing six metre operation on a limited trial basis.

Dave J52US has been very active since receiving six metre equipment. Zimbabwe is the latest southern African country to be granted permanent six metre operation, with Mal Z23JO active with 10 watts and a 4 element yagi.. CT3BX has been active and Tom 9Q5NW, in Kinshasa, now has 100 watts on six metres.

The Ross Hull Contest

I am sorry the Ross Hull Contest received so little enthusiastic support. The need to exchange a locator grid square number threw many operators into a mild flap with most not knowing their square. Fortunately, I realised in advance the inadequacy of the Maidenhead Locator Square map published in November 1987 AR, so purchased an atlas which for most of Australia and New Zealand, gave co-ordinates to two degrees of longitude and one degree of latitude. I used see-through marker pens to define the borders of the rectangles, wrote in the square number and was then able to help other operators decide their square number.

I cannot spend much space on the matter this month, but suffice to say that the Contest has lost all its incentives towards participation, eg a hard-won contact on 70cm is worth no more than an easy contact on six metres. Even on that band, I had to fight the eastern States QRM to work FK1TS who was kind enough to exchange numbers, but it was still only worth one point to me, plus the square multiplier. ZLs were not the least interested, what was one point when they could have a chat! The VK6s felt they were out on a limb again, especially with reduced Es openings. They gave a number if asked but mostly did not volunteer one! Wally, VK6KZ, probably summed it up by entering a log of one Ross Hull contact on two metres with Peter VK8ZLX!

Two metres and above

While much glory is obviously gone to six metres during the summer, nevertheless, two metres has had its interesting moments. 22/12 was one of the better Es days with two metres available in Queensland for much of the day. From Townsville John VK4FNQ worked VK3BDL, 3UM and 3AMZ and VK4FXX worked VK3AUU, 3UM, 3BB and 3AMZ. Bill VK4ZWH at Bundaberg worked VK3AUU, 3UM and 3ZJC. Rob VK4TKA in Rockhampton worked VK3AUU at 0821, VK3UM and VK3ZJC at 0844, VK1VP at 0855, VK5LP at 0942 at 5x9. VK4KJL in Brisbane worked VK2,3,5 and 7. Many other similar contacts are not reported. Last month I briefly reported the excellent opening on 24/12 at 0750 when VK8ZLX and VK8RF worked 12 stations in Perth, including Wally VK6KZ twice, once in his car. 27/12: John VK4FNQ mobile 160km west of Townsville heard the VK1RCC beacon on 144.100; after many calls VK1RX was heard, no contact made.

29/12 VK2 were working ZL3 around 0200.

30/12: VK2,3,4 working one another. 31/12: VK2 to ZL again. 3/1/89: Roy VK3AOS worked VK4BRG in Mackay; 4/1:L weak CW at 0919. VK4ZAZ and 4QE heard in Melbourne. From 0920 VK8ZLX worked VK3DUT, 3APW, 3AIH, VK5ZRK, 5ZRO, 5NC, 5ZDR, 5LP. VK8KTM also on. On 16/1 VK8 worked VK2,3 and 5. Unusual circumstances at 0530 on 21/1 when Roger VK5NY worked Wally VK6WG in Albany at S9 plus but S2 at VK5LP. It was either a very selective set of conditions or else the contact may have been via Es and not tropo.

On 432 John VK3ZJC says contacts have been made with VK1BG, 1VP, 2ZAB, 3XRS, 5NC, and 7ZBT, 1296 MHZ stations worked in Melbourne recently include VK3BBU, 3KAJ, 3YTV, 3ZBJ, 3ZGJ, 3ZPW and 5NC. New stations on 1296 are Andy VK3WH, Wayne VK3AIV, Peter VK3ZYN and Geoff VK3YJM.

John also reports a group of Geelong amateurs are to install a 432 MHz beacon in a prime loation. It will radiate high ERP to have a chance of indicating conditions across the Great Australian Bight.

On the tropo scene, many contacts have been made across Southern Australia. 23/12 at 2238 VK5NC to VK3KXL and VK3ZBJ at S9 on 144, 432 and 1296 MHz. 27/12 0400 VK5NC, 5NY to VK3NM , 3APW. 28/12 VK5NC to VK3KXW, 3ACW and 3AUU on 144 and 432. 16/1: At 1010 John VK5KAF operating with a vertical antenna from Kangaroo Island, worked by a number of Adelaide stations and VK5LP, the first station I have worked on the Island. 18/1: VK7RMC beacon very strong at 1020 but no one to work. 20/1: From 0932 VK5s to VK3AUG, 3AOS, 3DLM, 3LK, 3ZGJ and 3YTV, the latter two on 144 and 432. 23/1: 1200 VK6WG strong to VK5NY, 5x2 at VK5LP, but was 5x6 on 432; at 1209 Brian VK6YAU 5x6. This a father and son combination, VK6WG and VK6YAU. It is to be hoped Brian does not drift off to packet radio to the exclusion of other modes as others have done. 28/1: excellent signals to VK5MC, 5NC and 5AKJ on 432 around 1200. 30/1 good tropo to Albany and Melbourne from VK5 on 144 and 432.

John VK3ZJC says aircraft enhancement and tropo scatter activity continues with VK1BG, 1RX, 1VP, 1BUC, VK2ZAB, 2ZRE, 2ARA, VK3ZJC, 3KUB, 3AQU and 3XRS being involved.

EME Report

Doug VK3UM sends brief information on recent EME activity. From 1740 on 26/11 he worked SM4IVE, PA3CSG, DK3BU, DL9KR, OE5JFL and F1FHI. AT 1940 Faraday rotation changed and wiped out all signals.

On 17/12 worked K2UYH, UA9FAD, RA3YCR, RB5LGX, SM4IVE, IN3HER, PA3CSG, OE5JFL. On 18/12 N4GJV, ZL3AAD, WAA3FFC, WA9FWD and W7FN, the latter three being random contacts.

Since the installation of eight extra yagis, Doug feels his QSOs have decreased in similar operating time due to more defined Faraday rotation interaction. When Faraday is OK signals are great but in working yagi stations there seems to be a decreased performance. Doug is giving serious thoughts to the installations of a dish antenna to overcome some of these problems.

VHF Field Day

Stangely, there seemed a little more enthusiasm for this 24 hour VHF Field Day held on 28/1 - it did not seem so hard to obtain grid square numbers, perhaps operators had been conditioned by the Ross Hull Contest!

Unfortunately for VK3 and VK5 the weather was extremely hot and no doubt prevented some stations from going portable. It is known that VK5BW/5 and VK3ATL/3 were out in the field. The hot conditions did not assist propagation and it is believed very few across the border contacts were made. A reasonable Es opening between VK5 and VK2 helped some operators.

It may be possible to report further on this Field Day next month. VK5LP managed to rake up 33 contacts using 52, 144 and 432 MHz.

Closure

These notes this month have been put together with some difficulty. In order to comply with the request/direction of The Editor that at least 20% must be pruned from all contributions, the mass of information available this month has required very careful sifting; hopefully, a balance between actual happenings and general reading has been preserved. At present I pass on as much overseas information as I feel is useful because I believe we will miss exotic contacts on six metres if we are not forewarned on available operators.

Whilst the bulk of F2 contacts will probably appear around the equinox, so much continues to take place at any odd times that one needs to be constantly alert for the unusual contacts. As the solar flux goes higher the area of F2 coverage will move further south thus bringing more operators on air. Truly exciting times are ahead on six metres.

Closing with two thoughts for the month: "One of Life's puzzling oddities is that every centenarian has either used alcohol most of his life or has let it strictly alone" and "One can easily judge the character of a man by how he treats those who can do nothing for him." 73. The Voice by the Lake.

LATE SIX METRE NEWS

Macquarie Island Works Japan

On 3rd February three stations in the JA2 area worked VK9YQS/0 who is on Macquari Island. This is the first occasion that Macquarie Island has been able to work Japan on six metres. The Japanese stations were JE2DWZ, JA2BZY and JR2AAJS. The opening was brief being from 0746Zto 0805Z

Well done to all concerned. Let's hope that many more Japanese stations can work Macquarie Island. With such excellent propagation the path to the USA may open as well.

Thanks to Hat JA1VOK for the good information.

Wake Island

AH9AC is on Wake Island with a beam and a TR9300. Tom is active every weekend. He has worked into Japan. Who will be the lucky VK?

Gil VK3AUI.

ar

QSL

QSL's of the WIA collection (11)

Ken Matchett
VK3TL
PO Box 1
Seville 3130

VK2JQ

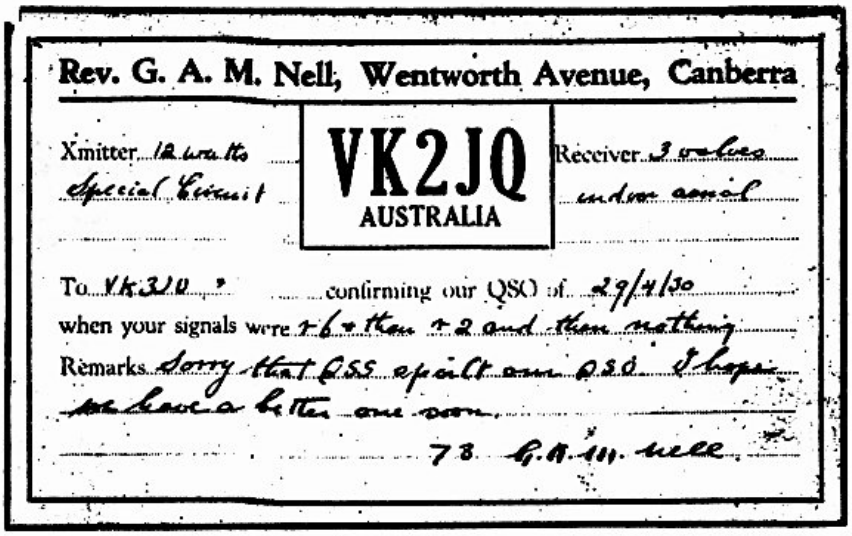
This QSL is one of very few pre-World War II QSLs from the Australian Capital Territory before the introduction of the VK1 prefix. The QSL is dated April 1930 just three years after the completion of the Federal Parliamentary building.

In the 1954 WIA Call Book there was only a NSW listing for VK2 but in the next year, station licencees of NSW and the ACT, although sharing the same prefix, were listed separately. It was in 1956 that the editor stated that the "most significant change to the call book" was the change in both listing and prefix of ACT licencees. This involved prefix change only, the remainder of the call being unchanged, ie VK2GU became VK1GU. In those days the VK1 prefix was also shared with Antarctica, Heard Is, Macquarie Is and Cocos Island.

The VK2JQ station was owned by the Rev GAM Nell who in later years operated in NSW with the same call-sign. Interesting are his notes "Xmitter 12 watts Special Circuit" and his receiver "3 valves, indoor aerial". Despite QRP and the indoor antenna, the Reverend Nell was quite successful in contacting VK3JU, a station owned in early years by H. Phillips of Mitcham.

VK5NR

One could not be blamed for associating this QSL with South Australian origins. In fact it was for a QSO from the Northern Territory. In the early years both South Australian and Northern Territory stations shared the same VK5 prefix. They still had the same prefix but were listed separately in the June 1956 edition of the WIA Call Book. It was not until 1st July 1960 that the



Rev. G. A. M. Nell, Wentworth Avenue, Canberra

Xmitter 12 watts Special Circuit

VK2JQ
AUSTRALIA

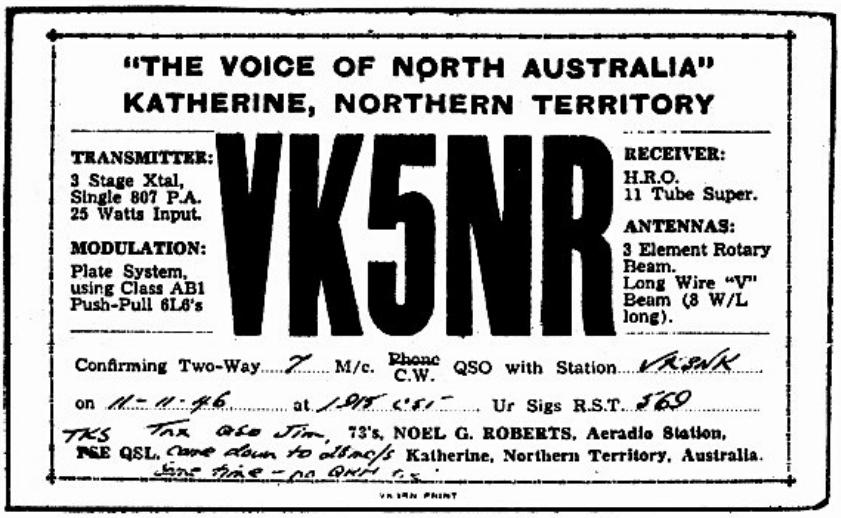
Receiver 3 valves under aerial

To VK3JO confirming our QSO of 29/4/30

when your signals were R6 then R2 and then nothing

Remarks Sorry that QSS spoilt our QSO. I hope we have a better one soon.

73 G. A. M. Nell



"THE VOICE OF NORTH AUSTRALIA"
KATHERINE, NORTHERN TERRITORY

TRANSMITTER:
3 Stage Xtal,
Single 807 P.A.
25 Watts Input.

MODULATION:
Plate System,
using Class AB1
Push-Pull 6L6's

VK5NR

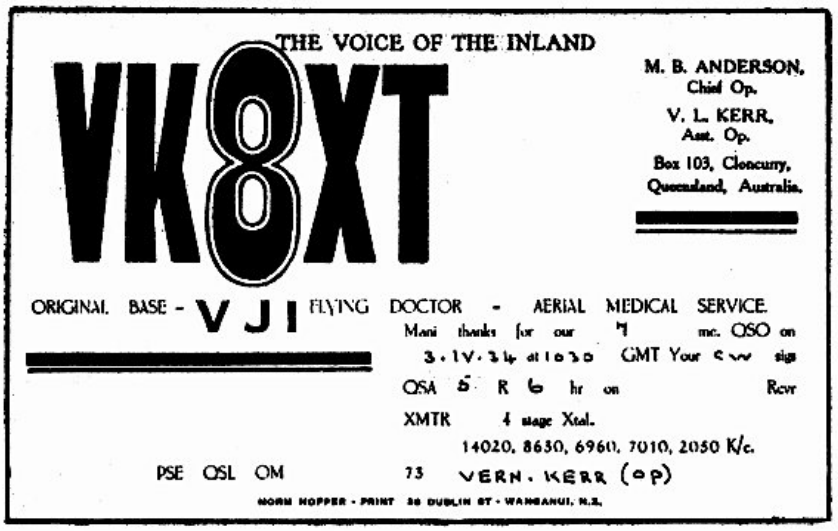
RECEIVER:
H.R.O.
11 Tube Super.

ANTENNAS:
3 Element Rotary Beam.
Long Wire "V" Beam (8 W/L long).

Confirming Two-Way 7 M/c. Phone C.W. QSO with Station VK3NK

on 11-11-46 at 1015 G.M.T. Ur Sigs R.S.T. 569

TKS Thx QSO Jim, 73's, NOEL G. ROBERTS, Aeradio Station,
PSE QSL. Care down to address Katherine, Northern Territory, Australia.
Same time - 20 GMT c.s.



THE VOICE OF THE INLAND

VK8XT

M. B. ANDERSON,
Chief Op.
V. L. KERR,
Asst. Op.
Box 103, Cloncurry,
Queensland, Australia.

ORIGINAL BASE - VJI FLYING DOCTOR - AERIAL MEDICAL SERVICE

Many thanks for our [illegible] mc. QSO on 3-IV-34 at 1030 GMT Your [illegible] sigs QSA 5 R 6 hr on Rcvr

XMTR 4 stage Xtal.
14020, 8630, 6960, 7010, 2050 K/c.

PSE QSL OM 73 VERN. KERR (op)

NORM HOPPER - PRINT 58 DUBLIN ST - WANGANUI, N.Z.

NT stations assumed the VK8 prefix, being listed with the new prefix in the 1960/61 edition of the Call Book. Noel Roberts the "Voice of North Australia" was using the old faithful 807 power pentode tube with a couple of 6L6s in his modulator.

VK8XT

In the early days of radio the prefix VK8 was used for portable operation. In the June 1988 edition of "Amateur Radio" readers will recall that the historic 8AB-8AC QSL was featured. This was a QSL from the 1920s, the operator Harry Kauper stating on the card "Adelaide at present and wl (sic) go to Alice Springs later .....".

The VK8XT QSL presented this month belongs to a later era - It is dated April 1934 and was for a QSO emanating from Cloncurry, Queensland. This QSL like the 8AB - 8AC one, is of quite historical significance. The operator's name (on the bottom of the QSL) was Vern Kerr who took up his appointment of Assistant Operator in the same year as this QSO. The AIM (Australian Inland Mission) had chosen Cloncurry as the site of its first Flying Doctor Base. At that time the service was called the "Aerial Medical Service". The main reason for the choice was not only that the location was near both mining and pastoral areas but that it was the centre of operations of the newly established inland air service called QANTAS. The base became operational in May 1928 and it is interesting to note that Vernon Kerr was at that time its first Base Director. In the book entitled "A pictorial History of the Royal Flying Doctor Service" by Michael Page, there is a splendid photograph of Vern Kerr himself standing outside the old wooden Flying Doctor Base (it was not granted the Royal title until 1955). He is also featured in the excellent article in Amateur Radio Action Vol 10 No 2 entitled "John Flynn - The reluctant Amateur" by Mervyn Eunson VK4SO. The original Base Station (established by Alf Traeger) set up with six pedal radios found a place in the vestry of the Presbyterian Church with an electrical generator powered by a petrol engine being housed in a shed behind the church. The call 8XT (used before the allocation of the VK prefix to Australia) was, according to Mervyn operated by Alf Traeger, Flynn himself operating as 8XF. These were amongst the calls that were used when field tests were being conducted at Cloncurry in order to determine the best equipment to use. The VK8XT QSL states that the original base used the call VJ1. This was a licensed "ground station" as distinct from an experimental one. (The call VJ1 was later transferred to the Mount Isa Base where it is still used today). The other name, MB Anderson (Chief Operator), on the VK8XT QSL was in fact, the first Flying Doctor Base operator appointed by the Australian Inland Mission, which body did so much to establish radio communication between both aircraft and outback stations in those early days.

Correction

In the November 1988 issue of "Amateur Radio", page 50, an account was given of the QSL from 9M2TR. This in fact was received from a different Tunku Abdul Rahman and not the former Prime Minister of the newly-formed Malaysia. The operator of station 9M2TR also carries the title of His Highness and is closely related to the Sultan of Johore. He is a prominent business man in West Malaysia who received his schooling in Western Australia. An apology is offered for the misunderstanding.

SOLUTION PAGE 55

MORSEWORD 24

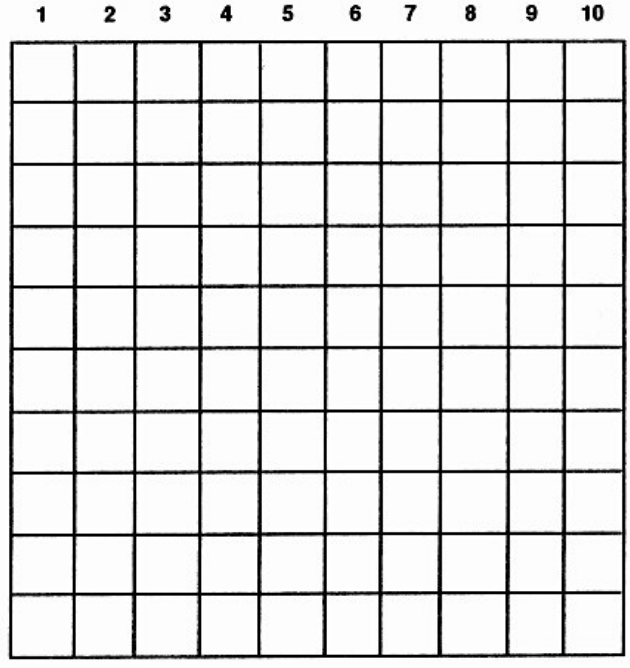
Clues to morseword 24

Across

1 Russian name
2 Chapeaux
3 Scythed
4 Avenue
5 Mature
6 Bantu warriors
7 Sulk
8 Aft
9 Digs
10 Fail to hit

Down

1 Simple
2 Very cold
3 Dim
4 Picture
5 Fright
6 Planet
7 Seed case
8 Flans
9 Attempted
10 Contests



VK2 MINIBULLETIN

Tm Mills VK2ZTM
Minibulletin Editor
PO Box 1066
Parramatta 2124

AGM 1988/89

VK2 Members are advised that the Annual General Meeting of the NSW Division will be held at Amateur Radio House, 109 Wigram Street, Parramatta on Saturday afternoon 29 April 1989 at 2 pm.

Matters for discussion at the AGM and nominations for next year's Council must be received in writing at the office of the NSW Division, 109 Wigram Street, Parramatta by 2 pm on 15 March 1989.

The AGM Agenda and annual reports will be conveyed to Members in early April.

Activities for March

The Orange ARC will be displaying Amateur Radio at the Sport and Leisure Show 10 to 12 March...WICEN exercise, cave rescue at Bungonia 11/12....Urunga convention on the North Coast over Easter.....Postcode contest on Friday 31 9 to 11 pm, is 2 metre FM.....Trash and Treasure will be held a week later, April 2, at VK2WI Dural (Normal day clashes with Easter).

Several visits to Clubs by Divisional Councillors have already been made. Any club interested in hearing more about the WIA from a Councillor should arrange this by writing to Council.

During February three nights of lectures on the Spectrum Analyzer were given at Amateur Radio House. Lectures on other topics will be delivered throughout the year, usually Friday nights. Details will be given on the VK2WI broadcasts.

Nomination forms for those who wish to serve on Divisional Council are available from the office. Can you assist?

Warm welcome to the new membership applications for February:

D.J. Barnard	VK2PYE	Round Corner
R.R. Black	VK2BBR	Lismore
S.H. Groes	Assoc	Galston
M.J. Hanscomb	VK2ZMJ	Botany
G.M. Kelly	VK2ZGK	Glenhaven
J.J. Meekings	VK2TJM	Mt Pleasant
C.J. Nutt	VK2DCT	Gladesville
L.K. Pearce	Assoc	Bega
L.J. Sim	Assoc	Padstow
A.B. Simeon	VK2EETH	Port Macquarie
B.W. Smith	Assoc	Kingaroy
K.S. Smith	Assoc	Mt Druitt
W.B. Smith	Assoc	Mt Druitt
L.R. Winzer	Assoc	Holbrook

Slow Morse Sessions

VK2BWI daily on 3550 kHz, 0930 UTC. Automatic transmissions provided by Hornsby

& DARC from VK2RCW on 3699 kHz and 144.950 MHz. Continuous.

Telephone News

A weekly news summary available by phone on 02 651 1489.

Correspondence Course

Available anytime, anywhere. Details from office.

Trash and Treasure

Sales last Sunday every odd numbered month at Parramatta car park

Postcode contests

Last Friday evening every month. Details broadcasts.

QSL Bureau

Provided by Westlake ARC for the Division at Teralba, PO Box 1 Teralba 2284. Details from them or the office.

WICEN

Details and information sheet available from the office.

Awards

A range of AWARDS was introduced by the VK2 Division during last year. A current list available from the office.

Parramatta Office

Houses the office, library and meeting area. VK2AWI station being established. A range of publications available from the Bookshop.

Dural Property

Site of VK2WI broadcast facilities, VK2RWI repeaters and VK2RSY Beacons. 5 acre site with barbecue facilities.

Most VK2 Clubs and Groups are affiliated with the VK2 Division. A Club Conference is held twice a year. The Divisional Education Service has published a range of books to help those wishing to enter Amateur Radio. Details from the office. Bulk and mail order purchases from PO Box 262 Rydalmere.

The weekly news broadcasts are preceded by a 15 minute technical and historic tape. Divisional, Federal and Club news, IPS reports and news of other happening included in the main session. Most of the news content is available on VK2RWI bulletin board and other boards. Telephone summary on 02 651 1489.

Please direct any inquiry to the VK2 Division during the office hours 11am to 2 pm weekdays or Wednesday evening 7 to 9pm. Address all mail to PO Box 1066 Parramatta NSW 2124. An expanded range of information sheets is available for collection from the office and is sent to all new Members. Most Affiliated Club Secretaries should have this information, check with them. ar

VK3 NOTES

New address

Bill Trigg
VK3PTW

The WIA Victorian Division has relocated its headquarters.

The new address is:-

38 Taylor Street,
Ashburton 3147

The new telephone number is 259 9261.

The year 1989 will see dramatic changes in the operation of the WIA Victorian Division. The Divisional Council, at its meeting on the 30th of January, appointed Barry Wilton VK3XV to become the Division's General Manager.

Barry will be responsible for overseeing the financial management and administration of the Division, the delivery of membership services, examining possible new services and sources of revenue, and operations at the new Divisional Headquarters.

He will handle membership service enquiries, computerise all records of the division, and be the first point of contact for those wanting to join the hobby of amateur radio or become a WIA member.

Barry will staff the Headquarters on Tuesdays and Thursdays between the hours of 9am and 4 pm. The possibility of opening on a week night or a Saturday is currently being carefully examined.

Using modern business communications technology including facsimile machines and personal computers, administration of the Division will be greatly streamlined.

The Council is confident that more efficient use of its resources will lead to better services for WIA members. ar

VK6 BULLETIN

VHF Group

John Sparkes VK6JX
83 Anemone Way
Mullaloo
6025

The VHF Group of WA Inc is one of the largest groups affiliated with the WIA, WA Division. It has around 100 members, 15 of which have been honoured with life memberships.

The Group's aim is to nurture and further activity and interest in VHF and higher bands within the great state of VK6.

General meetings are held on the 4th Monday of every month at Wireless Hill, starting at 8pm. This is an appropriate venue, as this site is home to a very large museum of radio equipment - some old, some recent.

The Group's new president, Craig VK6CC (QTHR), wishes to extend a very warm welcome to ALL amateurs or other interested parties who have not yet attended one of the Group's very interesting meetings, usually made even better by a technical lecture or presentation on some aspect of VHF communications.

Another crowd pleaser is the Junk Sale which usually occurs every 4 months at the General meeting. A lot of nifty bargains are generally snapped up at low prices.

Committee meetings are held on the 3rd Monday of each month. Shortly after, the Group's very informative monthly Bulletin is posted to all members. This journal is a good blend of local happenings and informative technical articles - and it's hardly ever late!

The Group runs a very well stocked Parts and Materials Shop at each monthly General Meeting providing standard as well as those "hard to find" items you'll need for that VHF homebrew project you've been planning.

Stock includes Doubly Balanced Mixers, Receiver R F Amplifier Devices, VHF/UHF P A transistors, ceramic and polystyrene trimmer capacitors, BNC connectors and heaps of top quality Belden 9913 coaxial cable which you'll definitely need if there's going to be any signal left for the antenna to radiate!

The main external activity sponsored by the Group is the monthly FOX HUNT. These occur on the Saturday evening preceding each Gen-

eral Meeting and start at 8pm from the Women's Memorial at King's Park overlooking the City of Perth. These are a heck of a lot of fun and ALL are welcome. If you are interested in joining in, it will pay you to be an observer initially, so contact one of the committee members who will try to get you included in one of the "GUN" teams!

Equipment required is a 2 metre receiver and a steerable beam antenna on your car. Once you run "Reynard" down, you'll then need a handheld "sniffer" antenna to track him to his lair. First in is the winner.

Fox hunters may then retire to a member's QTH to discuss next month's strategy over refreshments.

The Group is also establishing a monthly VHF QRP contest - generally operating on 146.500 MHz on the Sunday following the General Meeting between 11am and 12 noon. Scoring is simple, being based on power and distance - less of the former and more of the latter guarantees you a good score. There's even a multiplier thrown in for portable operation to help stir up some friendly competition!

The Group is gradually assembling a first-rate operational shack at Wireless Hill. The mast and various antennae are aloft, and custody of the now defunct WAIT Radio Club's equipment has provided the new shack with HF and all-mode VHF capabilities. To date, the RD contest and JOTA have been undertaken from the shack and the Group will soon be a force to be reckoned with on all bands. 73's

John Sparkes, VK6JX
ar

ALARA

Amateur Tourists?

Joy Collis VK2EBX
PO Box 22
Yeeoral 2868

Amateur radio is full of pleasant little surprises! Having completed shopping at the local supermarket one Friday afternoon recently the OM and I spotted a four wheel drive vehicle sprouting aerials, towing a caravan and looking a little "lost." We pulled up alongside and the conversation went something like this:

"Joy?" "Yes. Follow us."

Round the corner to the Collis abode.

"Who do we have this time?"

It turned out to be Marlene VK3FML and OM Jim VK3FFF calling in on their way south from a holiday trip. Jim's comment: "Do you always pick up strays like this?

They were somewhat surprised, on asking a "local" where we lived, not only to receive that information, but also to be told that we were doing our grocery shopping, and the type of car we were driving. That's what small towns are like, I guess, and Yeoval is no exception.

It was a great pleasure to meet them both, and put more "faces to voices".

Wanted: YL operators for Field Day 1989

Maggie VK3CFI is wondering if any YL would be interested in assisting her during the Field Day held this month:

"For Field Day 1987 I entered the six hour CW only section and I won! Actually I'm not all that concerned about winning. I am not an experienced contester. Just participating was a great experience. Is anyone out there interested? My preference is CW but I would be perfectly happy running phone or both modes.

I would like to operate from Red Rock, atop a dead volcano here in Colac. There are heaps of tall trees for stringing up antennas, plus shelter from the weather. Colac is exactly two hours from Melbourne by way of Geelong. Or perhaps some other place?

I would like to try the 24 hour section, but not without company. I will supply the rigs and antennas.

Well. What do you think? Please give it a thought and let me know." (Maggie Iaquinto, VK3CFI.)

Maggie's address for any interested YL is:
PO Box 285, Colac,
Victoria, 3250.
Please contact her as soon as possible.

Denise VK5YL, Val VK4VR, Meg VK5AOV, Myrna VK5YW, Jenny VK5ANW and Joy VK5YJ.
At the home of Denise VK5YL and David VK5RN to enable the VK5 girls to meet up with Val VK4VR and family while they were in SA 30/10/88

DX YL to North American YL contest

CW: Wednesday 12 April 1989 at 1400 UTC
Ends 14 April at 0200 UTC
Phone: Wednesday 19th April 1989 at 1400 UTC
Ends 21st April at 0200 UTC.

DX YLs call "CQ North American YL". Separate logs for each contest, working only 24 hours of the 36 hours in each contest. 1 point for each band a station is worked on. Multiply the number of QSOs by the number of different states/provinces/countries worked. Contestants running 150 watts or less on CW and 300 watts PEP or less on SSB at all times may multiply the total by 1.25 low power multiplier.

Log must be postmarked by 5th May 1989, and received no later than 26th May 1989 by:

Vice President YLRL, Carol Shrader WI4K, 4744, Thoroughgood Drive, Virginia Beach, VA 23455 USA.

Farewell to Marj VK3HQ

It is sad to advise that Marj VK3HQ has become a silent key. A lovely lady in all senses of the word. Marj joined ALARA on 3rd October 1976 and, with her OM Clive, came to any function she could.

Marj had completed 56 years as a holder of an amateur licence on 18 November 1988, and had been presented with a bud vase by ALARA earlier this year to mark such a wonderful achievement.

Alara award update

Cert No	Date 1988	Name	Call sign	Sticker	Bicent Sticker
37	9th Dec	Bev Hebiton	AX6DE	12	1
119	9th Dec	Alan Hughes	ZL3KR	2	
9	9th Dec	Mavis Stafford	AX3KS	9	1
33	9th Dec	Ivor Stafford	AX3XB	1	1
		(All CW.)			
46	14th Dec	Celia Reed	ZL1ALK	6	1
145	14th Dec	Charles Thorpe	L40018		1
		(All 14 MHz SSB)			

Marj's mother became VK3HM in the mid-1920s, the first licensed YL in VK3 to transmit, following the example of Alan VK3HL, her son and Marj's brother. Listening in on the headphones roused Marj's interest and she worked for and obtained her own licence.

In Japan with the British Commonwealth Occupation Force in 1947, Marj, a member of the RAAF Nursing Service, married Clive. They set up home at Bentleigh, Victoria, in 1949.

Though retaining an interest in amateur radio, Marj did not activate her station again, but kept her callsign. Marj was a highly respected member of her church as shown by the number at her funeral service there.

In addition to her church interest she had worked hard for the care of the intellectually handicapped.

To Clive, their children and their grandchildren, we offer the sympathy of all members of ALARA

(Mavis VK3KS and Bron VK3DYF.)

Here and there

Many ALARA members took to the road (and in some cases the air and the water) in 1988, among them Bev VK6DE, who "campervanned" around New Zealand with OM Brian VK6AI and son Colin, Helene VK7HD, who spent an enjoyable holiday in Canada and Gwen VK3DYL, our Sponsorship Secretary, who carried out an "inspection tour" of the USA. In every case the hospitality extended by overseas YLs and their families was overwhelming.

Wendy VK4BSQ, OM Geoff and family went voyaging in their vessel "Timshel" to Papua New Guinea, and learnt many interesting things about the lifestyle of the people with whom they came in contact.

Many VKs toured within their own country, and found that strange towns seem more friendly when there is someome to call on radio or visit along the way. Happily this is often the case with amateur radio operators.

Bits and Pieces

Joan VK3BJB (who learnt Japanese via amateur radio), was involved in two "search and rescue" operations for a lone Japanese yachtsman in 1988. She acted as Yacht Net controller, and was the first female controller of the Japanese Maritime Mobile Net. She also spoke on radio, at Rotary Club meetings and met many of her Japanese friends. At present she is busy learning to write simple Japanese characters, which she finds a very interesting and worthwhile occupation.

Many people who think the NZ WAROCentury Award impossible to achieve will be pleased to know this is not the case. Dawn ZL2AGX has managed 100 WARO contacts.

Congratulations to Christine VK5KTY on her upgrade to VK5CTY and Jan VK6PJL, now VK6DJL.

Bev VK6DE has regular skeds with Trish VK6PBA/MM, last heard of at Phunket Island, Thailand. Several other ALARA members have talked to Trish during these skeds.

Although 1988 with all its activity is behind us, there are still at least two new YL Awards to work for: The YLRL 50th Anniversay Award (details November "AR") and the NZWARO Mountain Buttercup Award. (Details next month)

Listen for VK3FYL during April. This is Lois WB3EFQ, who, together with OM Tom, will be investigating life "down under."

Liz W3CDQ recently celebrated her 90th birthday, presumably our oldest member.

New members

Welcome to Margaret ZL1TDB, Walli DJ6US, Melva ZL4IO and Mary WB7SUQ. Good to-have you with us.

Until next month:
73/33
ar

A new challenge for DXERS - climb up the DX QSL contributors' ladder

The WIA QSL card collection is lacking several rare DX countries, prefixes and special commemorative QSLs.

The collection curator Ken Matchett VK3TL has come up with a novel idea to encourage the donation of this type of QSL card.

It's intended to publish a DXER's QSL Contributors Ladder each month naming those who contribute QSLs from the following three categories.

Fifty ladder points will be awarded for QSL cards from DX countries which are not yet part of the WIA collection.

QSLs for a callsign prefix new to the collection attract two points.

And each QSL from a special event, commemorative station, national radio club or society, or memorial amateur radio station gains one point.

At the end of 12 months the generosity of the DXERS at the top of the ladder will be rewarded.

Ken Matchett says he admits it's a bit of a gimmick but it should still be a lot of fun.

Perhaps you have QSL cards suitable for donation to the WIA collection? Maybe duplicate cards from a DX contact - these could make a valuabale addition to the collection.

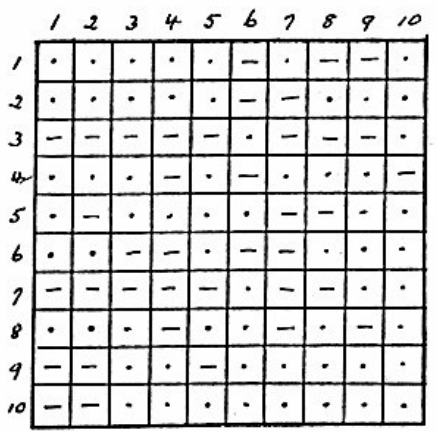
For further information contact Ken Matchett VK3TL, PO Box 1, Seville 3139, Victoria - or telephone (059) 64 3721 for a possible QSL card pick up.

The WIA QSL card collection is helping preserve an important aspect of the heritage of our hobby - amateur radio - can you help?

Answer to Morseword 24 Page 52

Across: 1 Ivan 2 hats 3 mown 4 street 5 ripe 6 Impi 7 mope 8 stern 9 mines 10 miss

Down: 1 easy 2 ice 3 fade 4 image 5 fear 6 Mars 7 pod 8 tarts 9 tried 10 vies



Packet survey

The aim of this survey is to find out a little about the current Packet Population and what they expect to see in the future.
Information gathered in this survey will be used to help plan the future of Packet Radio in Australia.
Please send your completed survey to:

Packet Survey
C/-
WIA ACT Division
PO Box 600
Canberra ACT
2601

Where there are multiple choices for a question answer Yes/No for all that apply.

1. What is your location? City/State .....

.....

2. How did you get interested in Packet Radio? .....

.....

3. What TNC type do you use? .....

.....

4. What radio type do you use? .....

.....

5. What is your main interest within Packet Radio?

   AMSAT .....
   TCP/IP - Networking .....
   Ragchewing .....
   File Transfer .....
   HF .....
   BBS Reading .....
   Home Brewing .....
   Other (Specify) .....

6. How often would you use of BBS?

   Daily .....
   Weekly .....
   Fortnightly .....
   Other .....

7. What types of messages do you normally read?

   General Bulletin .....
   Personal .....
   Local interest .....
   Special Interest Group .....
   Other (Specify) .....

8. What is your biggest source of irritation concerning Packet Radio?

   Digipeating .....
   BBS's .....
   Beacons .....
   Politics .....
   Junk Mail .....
   Other (Specify) .....

9. Why is this irritating? .....

.....

10. What do you think is the biggest advantage that Packet Radio has? .....

.....

11. What do you think is the biggest disadvantage that Packet Radio has? .....

.....

12. Do you think the Packet Radio Network needs to be improved?

    Yes .....
    No .....

13. Where do you think Packet Radio is heading? (ie Is this all? What is next?)

.....

.....

14. Is this the 'Right' direction to head in?

.....

.....

PACKET SURVEY

15. Would you be prepared to upgrade your equipment (ie TNC, Modem, Computer or Radio) if necessary to help upgrade the total network?

Yes ..... No .....

If Yes, then by how much?

.....

.....

If No, then why?

....

.....

16. Would you be prepared to make a monetary contribution towards upgrading the packet network? (Note this isn't asking you to pay up right now)

Yes ..... No .....

17. Please list all the organisations you know of that are involved in Packet Radio.

....

.....

We are not interested in exactly who you are. If you don't wish us to know then omit your name from the envelope and survey form.

Carl Makin (VK1KCM)
Chairman
On behalf of the ACT Packet Radio Grou

End signalled for Morse code

As anticipated in an earlier article in AR magazine, the International Maritime Organisation (IMO) has given the go-ahead for the introduction of a system replacing Morse Code.

The global maritime distress and safety system will be introduced in 1993, from which time Morse will no longer be a requirement for ships at sea.

Under development since the 1970s, the new system will include the ability to send a distress signal including the vessel's co-ordinates by simply pushing a button.

The IMO said from 1999 the system will be compulsory on ships worldwide.

KENWOOD

AMATEUR LINE-UP

Kenwood's amateur lineup for 1988 incorporates the latest developments in communications technology.

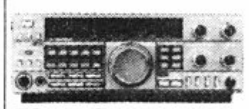
Superior front end specifications are accompanied by the latest developments in transmitter design. Automatic antenna tuning and advanced digital & microprocessor technology make these the easiest to operate Kenwoods ever.

Personal computer control is available on several models.

HF

TS-940S

Competition Quality HF Transceiver. Transmitter SSB, CW, AM, FM and FSK 160-10 metres bands. Output 250W PEP. Automatic antenna tuner. Receiver 150kHz-30MHz continuous. 40 memories, programmable and band scans. Power requirement 240VAC, 50-60Hz



TS-440S

Compact HF Transceiver. Transmitter SSB/CW/FM/AFSK 160-10 metre bands. Output 200W PEP. Optional automatic antenna tuner. Receiver 100kHz-30MHz continuous. Power requirement 12-16VDC/20A max.

1.8-50MHz

TS-680S

High performance HF & 6 metre Transceiver. Transmitter SSB/CW, AM and FM modes. 160-6 metre bands. Output 100W PEP (160-10m) 10W (6m) Receiver 500kHz-30MHz continuous. Memory scan/band scan. Power req 12-16VDC/20A max.

VHF UHF

TR-751A
TR-851A

All-mode Transceivers. Frequency Range: TR-751A 144-148MHz, TR-851A 430-440MHz Transmitter SSB/CW/FM modes. Output 25W. Receiver sensitivity less than 0.11uV (TR-851A) Features include Auto-mode selection, dual digital VFOs, 10 memories plus "COM" channel. Optional Digital Channel Link System. Power req 13.8V ±15% 7.5A max

TH-25A
TH-45A

FM Handheld Transceivers. Frequency range TH-25 144-148MHz, TH-45 430-440MHz. Output 5W. Receiver sensitivity less than 0.16uV (TR-25) 14 multi-function memories, memory scan and band scan. Power req 6.0-16VDC/1.2A max

TS-711A
TS-811A

All-mode Transceivers. Transmitters modes SSB/CW/FM Frequency range TS-711: 144-148MHz TS-811: 430-440MHz Output 25W. Receiver sensitivity less than 0.2uV (TS-811). Features include 40 multi-function memories, programmable band scan and memory scan plus programmable memory channel lockout. Power req 240VAC, 13.8V DC/8.0A max

TM-221
TM-421

FM Mobile Transceivers. Transmitters Frequency range 144-148MHz (TR221) 430-440MHz (TR-421) Output 45W (TM-221) 35W (TM-421) Low power switch to 5W. Receiver Frequency Range 130-173.995MHz (TR-221) 438-449.995MHz (TR421) Sensitivity less than 0.16uV. Power requirements 13.8VDC ±15%/9.5A max

TH-215A
TH-415A

FM Handheld Transceivers. Transmitters Frequency Range 144-148MHz (TH-215) 430-440MHz (TH-415) Output 5W/0.5W (Hi/low) Receiver 141-163MHz (TH-215) 430-440MHz Scan modes include band, memory and programmable band scans with 3 scan stop modes. Power requirements 7.2-16V/2.0A max

VHF/UHF DUAL BANDER

TM-721A NEW

Dual band FM Transceiver with across band duplex. New for 1988, with dual watch, selectable full duplex cross band operation, automatic band change, 30 memory channels. Transmitter Frequency Range 144-148MHz/430-440MHz Output 45W (VHF) 35W (UHF) Receiver sensitivity 0.16uV (UHF)

RECEIVERS

R-5000

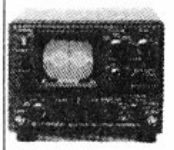
Communications Receiver. The R-5000 is a competition class communications receiver. It receives all modes (SSB, CW, AM, FM, FSK). Frequency coverage is 100kHz to 30MHz in 30 bands. Selectable IF filters and dual-mode noise blanking are incorporated. Power requirements 240VAC or 13.8V DC

RZ-1

Wide Band Receiver. The RZ-1 covers 500kHz-905MHz. Features include AM and FM reception, 100 easy to operate multi-function memory channels. Scan modes include VFO scan and memory scan plus programmable channel lockout. Power requirements 11-16V DC/1A max.

MISC.

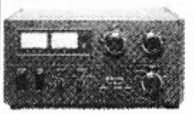
STATION MONITOR



SM-220

Based on a wide-frequency range oscilloscope, it combines a two tone generator, a wide variety of waveform observing capabilities.

HF LINEAR AMPLIFIER



TL922

A class AB$_2$ grounded-grid linear amplifier. Covers 160-10m for SSB, CW and RTTY modes. Drive Power 80W for full output. RF Input Power 2,000W PEP (SSB)

ANTENNA TUNER

AT-250

Optional automatic antenna tuner for the TS-680S. Features full coverage of 160-10 metres. Insertion loss less than 0.8dB. Through power 150W

REMOTE CONTROL HANDSET

RC-10

Connects to models TM-221, TM-421, TM-721. Provides all functions on the front panel. Will link together models TM-221/TM-421.

Kenwood Electronics Australia Pty Ltd

4E Woodcock Place, Lane Cove
Sydney, 2066, New South Wales
For your nearest dealer, please contact
PH: (02) 428 1455

Corrected circuit for Q-Meter

(AR November 1988). Original had several errors which have been removed in this version

Lloyd Butler VK5BR

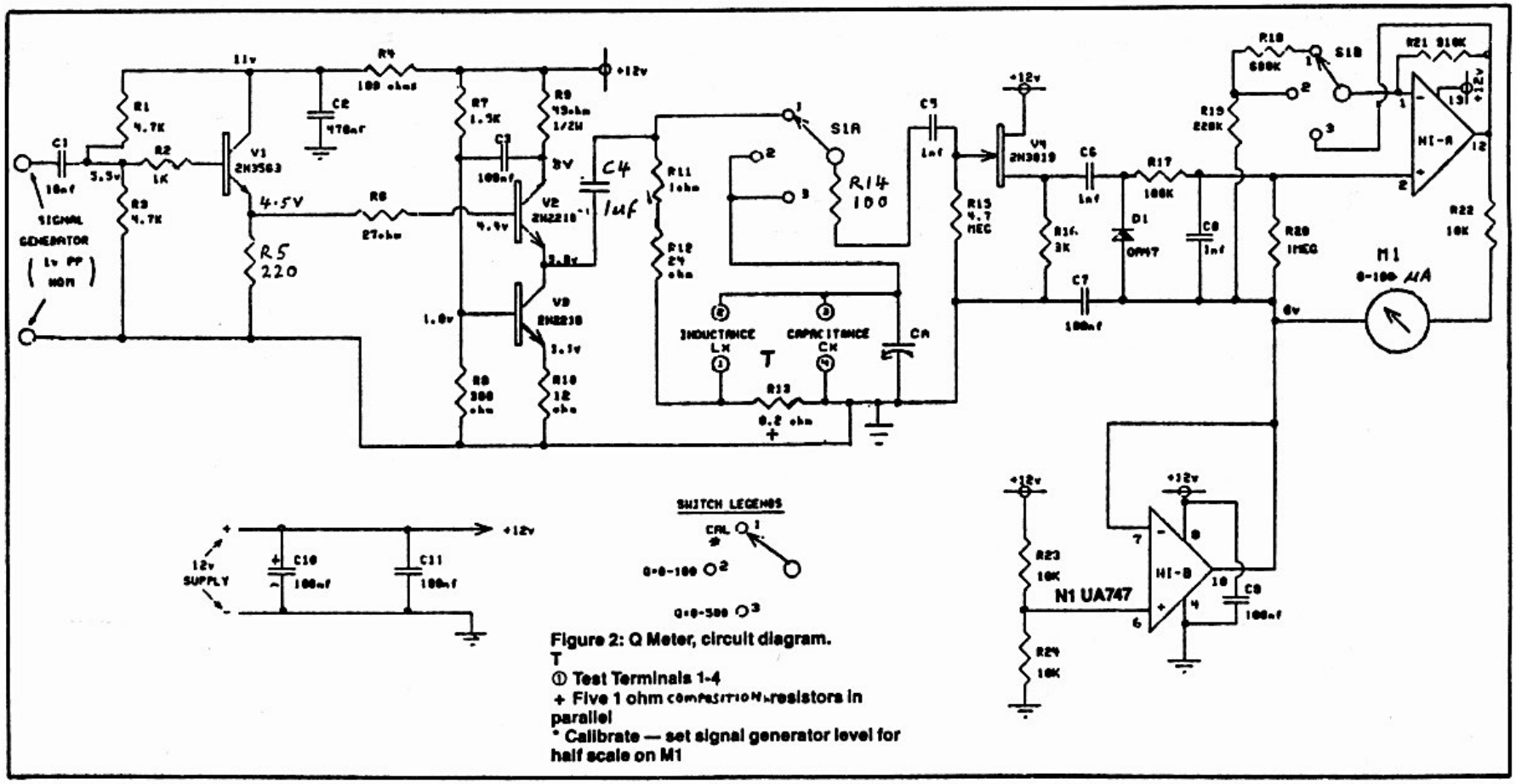


Figure 2: Q Meter, circuit diagram.
T
① Test Terminals 1-4
+ Five 1 ohm composition resistors in parallel
*** Calibrate — set signal generator level for half scale on M1**

OVER TO YOU

Not Felonious?

I note in September AR that the Central Highlands Amateur Radio Club of Tasmania raises revenue by fining members for various "felonies". While "sloppy radio procedure" and "misbehaving on air" may warrant a penalty, I disagree with discouraging the use of "Q Code" on phone. To me, the use of Morse abbreviations such as the "Q code" serve to aid memory retention. Frequent use lessens the likelihood of forgetting them, so I would encourage their use, by voice and in print.

A vexation to me is the use in print of terms such as: 73's, 73s, D.X., Q.S.L., mHz (millihertz) and Mhz for MHz, KW or Kw for kW, etc. It is very strange that many people actually add to an already self-explanatory abbreviation. Just why do they put in full stops, an extra letter and an apostrophe? (I wonder how many readers who don't use CW could immediately recite the Morse for apostrophe?). Perhaps a penalty could be applied to all amateur radio operators, SWLs and others who "should know better", for such abuses of abbreviations and symbols. The most confusing "felony" would be the use in typewriting of capital I instead of lower case l for the figure 1 when the typewriter does not have this digit.

73
Ian J. Stanley VK3CIS
PO Box 70
Ormond, 3204

Maritime Amateurs

The letter from Don Hopper in your January edition is very interesting. I had no idea that there were so many maritime nets in operation, neither did I realise that Don offers such 'on air' services as chart amendments, port information and so on.

Don mentions the difference in price between an amateur transceiver and 'type approved' marine equipment as a probable reason for yachts at sea preferring to use amateur radio. This is no doubt part of the reason, but I think you would find that most cruising yachts carrying amateur radio are carrying approved ship-to-shore equipment as well. In my experience the kind of commercial equipment suitable for installation on a yacht is of little use for communication over the distances that Don is talking about, ie distances such as to require the use of the 20m band. Until recently 'approved type' meant crystal control, another disadvantage compared to amateur equipment. Perhaps the wide and successful use of synthesized amateur equipment at sea helped bring about the development and approval of similar equipment for small yachts.

Don's letter was triggered by Lindsay Lawless's 'Topical Technicalities' in the August edition, in which Lindsay made the comment that advances in marine communication during the past 90 years have been due 'in no small measure to amateur yachtsmen and amateur radio operators'. Don can find no instances of this and does not agree.

Very few instances do come to mind, but the subject could easily repay some research. I can think of Francis Chichester, as an amateur yachtsman, introducing the use of aircraft navigation tables to marine navigation; Douglas Mawson, a private expeditioner to the Antarctic, introducing the use of a radio relay station (on Macquarie Island) in his 1911-13 expedition, and I suppose Marconi was both a radio amateur and an amateur yachtsman!

What does come to mind is the demand from a sizeable community of yachtsmen and radio operators in small vessels for light-weight, reliable equipment, for simplified navigation equipment and systems, gear that can be used by a tired person in a small yacht in a seaway. One contribution the amateur makes is to back this demand up by buying, installing, using and feeding back information on such equipment as it is developed.

Don mentions that none of the yachtsmen who came to him for instruction used a parallel rule. This might tell a story in itself. I use an articulated parallel rule (not a roller) at sea and in rough conditions it can be a very frustrating instrument.

At such times I have used a 'Douglas' protractor type parallel rule, which may come into Don's definition as 'fancy', but it works.

Retired professionals, as I imagine Don to be, make a fine contribution to our community, whether they be yachtsmen, musicians, navigators or whatever. The evaluation of new equipment, ideas and systems must test their professionalism, as must the occasional efforts of amateurs. The contribution of amateurs, however, to our arts and sciences has been significant and stems from the earliest of times. It deserves recognition.

Don Richards VK2BXM/VKOAT
The Ski Inn, Sackville Rd
Ebenezer 2756

Scout Communications

The Scout movement has for many years relied on Amateur Radio Operators, Radio Clubs and other Electronic enthusiasts for support when radio and electronics related activities are run for the Scouts each year. The support of these outside organisations and individuals is greatly appreciated by the leaders and the youth members, who understand the work that goes into these activities.

Looking forward to 1989 and beyond there is a need to provide an increasing amount of support for the Scout movement and to start helping the Scouts themselves become partly self- sufficient in these activities. Many large activities require communications within the camp. Large camps (eg Jamborees) provide Radio and Electronics related activities for the youth members. These require the same resource, skilled people.

In order to service the aims of the Scout movement, it is proposed to establish a Radio & Electronics Service Unit within the Victorian Branch of the Scout Association of Australia. This unit is open to all sections of the Scout movement, and other interested people.

This Radio and Electronics Service Unit will aim to provide the following services to the Scout Movement within Victoria.

1. A reliable group of radio operators with equipment to provide mobile and portable radio communications for large activities.
2. Skilled instructors to provide training to both leaders and youth sections in radio and electronics related activities.
3. Assistance and encouragement to all Scouting personnel in obtaining radio licences relevant to their needs.

It is emphasised that the aim of this Unit is not to close the ranks of the Scout movement to the people who have helped the movement before. Your help will still be welcomed. The aim is to use our own resources first and be supplemented by outside help.

If interested in joining this unit or for more information please contact the undersigned.

Philip Adams VK3JNI
Lot 1 Kangaroo Ground Rd
Wattle Glen 3096
Phone (03) 438 3013

Contest Bandwidth

Could I respond to Terry VK3DWZ who wrote in AR January 1989 about contests.

No, Terry, you don't make yourself unpopular with your comments. You do, however, look as if you are playing a little fast and loose with the facts. Letters such as yours have been appearing for a number of years and if you had bothered to do a little research you would have discovered:-

1. Many of the minor contests in the world do specify particular frequencies or particular bands of frequencies for their operations. In fact in IARU region 1 the member societies have agreed this should be policy.
2. There are contests on every weekend of the year. There are also some contests that do occupy a lot of band space. To then draw the conclusion that every weekend of the year has bands excessively

ooccupied by contests is either harmless hyperbole or deliberate misrepresentation.

3. For each mode (CW and SSB) there are currently only three contests a year that really do tie up the bands with a lot of traffic. They are ARRL DX, CQ WPX, and CQ WW. Some others tie up particular bands but not all bands. Even these do not use the new WARC bands.
4. The last time someone raised this nonsense I decided to investigate and found in the middle of the CQWWSSB there were no contest stations above 14.290 or below 14.130 for the vast bulk of the weekend.
5. A lot of rare DX only gets on during contests as the stations are specifically set up or operated particularly for the contest.

Don't feel that we don't want you on our bands, Terry, because we do. It's just that we prefer that people develop their operating skills rather than their whingeing skills. We prefer that people work on improving their station rather than working on ways that others can be COMPELLED to their opinion.

There are many ways to enjoy this hobby, if you have found that you are not very good at DX then try TV, or RTTY, or home brewing, but if you are going to take up letter writing then get your facts straight first.

Martin Luther VK5GN
GPO Box 931
Adelaide 5001

2m Simplex

I recently talked with a couple of novices on 2m who live in a remote area with no repeaters. They all used to listen on channel 50 until one of them bought an old set in which the only simplex frequency is 146.000 (channel 40). They all wished to use a common frequency, so they unwittingly changed to channel 40.

I wonder how many other novices (and/or others) do not realise or have forgotten that this once common simplex frequency now interferes with satellite downlinks? Please have a look at the bandplan or the data section of Dick Smith Catalogue, etc, for confirmation if required.

Also it seems to be little known that channel 50 (146.500) is a CALLING CHANNEL and not one for general conversation. We should use 6425, 6450, 6475, 6525, 6550 (ch 51), and 6575 etc, (some of which have been allocated to separate topics), for general conversation. This makes it easy to locate others, but, if we all talk on the CALLING channel, well, it's just like tying up a repeater instead of going simplex (but not to ch 50!).

Arthur Trevaskis VK7SE
RSD 1745
Penguin 7316

Key Clicks

The interim reply from Lindsay Lawless to my letter has left me even more confused than his original article on key clicks. My main objection to his article concerned his initial statement that 'a deliberately shaped transmitter output wave will radiate sidebands on key down and key up: an unshaped output will not'. This is quite false. It can be readily demonstrated, both mathematically and experimentally, that unshaped (ie rectangular) keying produces lots of sidebands.

In his reply to my letter, Lindsay says he is aware of the spectrum resulting from rectagular pulse modulation of a carrier, yet his article was based entirely on a belief that rectangular pulse modulation did not produce a spectrum of sidebands.

He then says that the original article was copied from an RAAF manual (but there was no acknowledgement or reference to this in the article), and that 'it is worth considering in light of the deficiencies of the popular theory'. But he does not say what the deficiencies are in the theory.

In my letter I sketched the spectrum of a single rectangular pulse of a sinusoidal carrier, and Lindsay appears to accept this as being correct. To obtain the spectrum of a sequence of Morse characters, one need only add up the spectra of the individual pulses making up the sequence, after taking into account the relative timing and width of the pulses. This is a straightforward, if somewhat tedious procedure, and the result obtained is that there are sidebands produced by the keying, and that it is these sidebands which are heard as key clicks. The effect of any filters in the transmitter is to modify the distribution of the sideband energy, but these filters are generally much broader than the channel spacing between CW stations. In any case, the response of such filters could be taken into accout in the analysis if need be. I am therefore puzzled by Lindsay's statement that spectral analysis of such a signal suggests that the 'popular' theory may be incomplete or incorrect. On what evidence is this statement based?

As a professional engineer I know that just because I can't get theory and practice to agree doesn't mean that the theory's wrong. In such a situation one should firstly ask 'is my understanding of the theory correct', and then 'am I applying the theory correctly to the situation'. Only if all else fails and the evidence is clear should one start to question the basic theory, and then if you're right you'll probably get a Nobel prize!

If this approach makes me a dogmatist, then so be it. I have no wish for technical censorship, but by the same token I cannot let an article which is based on an assumption that is blatantly and demonstrably false go by without challenge.

What concerns me the most is that some poor reader with a key click problem is going to accept Lindsay's article at face value, and decide that he can cure his key clicks by removing any wave shaping components, and then blame any further reports of clicks on the receiver's selective filters or antenna coupling units.

This would indeed be cause for despair.

Jeff Pages VK2BYY
11 Graham St
Calala, Tamworth 2340

SILENT KEYS

We regret to announce the recent passing of
Mr Alan R Herald VK2AHR
Mr P Cudmore VK2AMK
Mr Roy Kerr ex VK4DK
Mr Alex Smith VK8MQ
Mr N S Johnston L 20452
Mr J L Marshall L 40654

Alan R Herald VK2AHR

Alan passed away suddenly on December 21, 1988 at his home in Tura Beach, near Merimbula NSW, aged 70 years.

His interest in radio went back to the 1930s when he lived in Hamilton, Vic, building one and 2 valve regenerative receivers. In 1947 he obtained his AOCP (Call VK3AJP) and quickly became active on CW, an interest he kept up all through his amateur years. A keen constructor, Alan was sorry when the complexities of receiver/transmitters forced him to buy his faithful FT200, a rig he was using to the last.

While not involved in WIA organization, he nevertheless had a deep interest in WIA affairs.

After living at Surrey Hills for over 30 years, he moved to Tura Beach NSW where he resumed activities on 144, 14, 7 and 3.5 CW and SSB using the call VK2AHR, the closest he could get to his initials.

Although in latter years he suffered from severe back problems, he maintained a cheery attitude which was reflected in his many QSO skeds. His voice and fist will be greatly missed on air.

VALE my lifetime friend, Alan VK2AHR.
Stanley I Zeunert - VK3SZ

SILENT KEYS

Roy Kerr ex-K4DK

Roy, VK4DK, slipped quietly from the ranks of the OOTers and became an SK in Brisbane on 13th October 1988.

He commenced his professional career as a clerk/telegraphist at Winton Queensland and obtained his AOCP about the same time, in June 1937. His early years in AR were the most active. Winton had its own 240v DC supply, so no power source problems existed. Roy's first homebrewed rig used CL4s in PP-Par in the PA. Post-war he followed the fashion of most others and switched to 'disposals equipment'.

VK4DK had a very well-known brother, Vern VK4LK - one of the first opr/techs with the Royal Flying Doctor Service, who became known as 'the Voice of the West'. Roy used to QSY his rig out of the 'ham' bands to net with Vern at Station VJI at Cloncurry. In this way their umbrella of communications was extended and much helpful traffic for the residents of both towns was exchanged. The RI took a dim view of it; all but VK4DK saw it as just another example of 'bureaucratic myopia'.

Roy Kerr eventually rose to the status of 'gun' telegraphist. After years spent in places 'too far west', he was transferred to the VK4 'big smoke', where he served out the last twenty years prior to retirement 'pounding brass' in the main telegraphists' room, Brisbane. His superior code was often used on OTC links until micro-wave was introduced.

No nicer chap than Roy ever held a VK call. A great raconteur, he had the rare gift of vivid description, with a few well-chosen words and a chuckle in every phrase. His stories about the early telegraph and wireless out west were endless. I take the liberty to pass on just one.

'A busy 'singing wire' out of Winton continually snapped at the same place. An inspection by Roy and a couple of linesmen showed that the culprits were pink galahs - thousands of them perched on one particular span. The reason was a waterhole, one hundred yards away and not a tree in sight.

"OK", said Roy "Let's divert 'em".

"How?" asked a linesman.

"Erect three poles and two spans of the strongest, thickest wire available - that comes from and goes nowhere - closer to the water."

So the decoy was erected and it worked perfectly. There was no more trouble. Where in VK or anywhere else has a flock of birds had an imitation telegraph line erected for their special use??

VK4DK had a 'fast fist' but also a 'green thumb'. A hobby farmer, his speciality was growing prize dahlias: many championship ribbons and awards from State Exhibitions decorated his shack.

Roy faced his last long distressing illness with outstanding fortitude and cheerfulness - typical of his personality. All who knew him are the poorer for his passing. He was a member of the WIA pre-war but relinquished his call in 1951. The Institute extends its sincere condolences to his surviving widow, Isabel.

Alan Shawsmith, VK4SS
Historian WIAQ.

Alex Smith VK8MQ/ VM5MQ

Alex passed away suddenly at Alice Springs NT on November 2 1988 at the age of 53. He was born in 1935 at Aberdeen, Scotland. During his early career in the RAF he served in Iran at Habbaniya Air Base, where he operated the Club station YI2AM and worked many VKs. Alex, wife Pauline and two sons Ian and Andrew migrated to Australia in February 1963.

For 3 years Alex was attached to Long Range Weapons Research at Salisbury, SA. In 1967 he moved with his family to the Woomera Rocket Range SA, where he spent the next 18 years. He was a member of the Woomera Amateur Radio Club and served the Club in various administrative positions. Alex was a keen Dxer both on Phone and CW, working many different countries from here; but he always had time for a friendly chat.

He ran the P29JS 14220 net on a number of occasions in the late 70s. His wife Pauline died of cancer in 1983.

In 1985 Alex moved to Alice Springs NT to work for Australian Landsat. He became a member of the Alice Springs Radio Club and represented the Club at a WIA conference a few years ago, as a delegate. Alex was buried at Woomera SA on November 11, 1988.

Many of his friends attended the funeral. All who knew him extend their condolences to his family.

Austin Condon VK5WO
ar

HAMADS

TRADE ADS

MORSE: Receiving practice program includes 100 sample tests selectable speed training for AOCP send $20 for IBM-PC compatible disk: W Klompenhouwer, PO Box 95, Naime, SA, 5252.

RADFAX2: Hi-Res radio facsimile morse & rtty program for IBM PC/XT on 360K 5.25" floppy + full doc. Need CGA, input port, SSBhf FSK/ Tone decoder. Has re-align auto-start view save print. Also "RF2HERC" same as above but suitable for hercules card, and "RF2EGA" for EGA card (640X350 mode). Programs are $30 each + $3 postage only from M Delahunty, 42 Villiers Street, New Farm, Qld, 4005. Ph: (07) 3582785

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 millimetre SASE to: RJ & US IMPORTS, Box 157, Mortdale, NSW, 2223. (No inquiries at office please ... 11 Macken Street, Oatley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza. ACT.

WANTED - ACT

AUSTRALIAN OFFICIAL RECEIVER SERVICE MANUALS: Any year(s) or technical information sheets. valve radios, price and condition. Jock VK1LF QTHR Ph: (062) 866920 anytime. TNX.

FOR SALE - NSW

KENWOOD TS930S BUILT-IN TUNER: As new condition in original packing. Owner living overseas. $2000 ONO. Arthur VK2FFH (046) 461476 licensed amateurs only.

EX VK2WR FT107 $700, FT101B $350, FL2100B $1200, KW107 $100, Swan SWR Meter WM1500 $65, TS700A $1200, Multi 7 $125, TR2400 Hand Held $200, HF Vert Ant. POA. Please contact VK2BTL QTHR (02) 487 3383 for details. All equipt mint cond.

ICOM IC-471 COMMUNICATIONS RECEIVER: 100 kHZ to 30 MHz coverage. Mint condition. $1175 ONO. Kirt Ph: (02) 4362618.

YAESU 29ORA ALL MODE TRANSCEIVER: Nicads, charger, carry-case, mic. mint condition $650 ONO Webster band-spanner mobile 80-10M antenna $250 Peter, VK2DBI. QTHR. 063 675095.

KENWOOD TR.2400 HAND HELD 2 METRE TRANSCEIVER: Good condition with new Ni-CDS 10 programmable memories memory scan $240. John VK2ALJ. Ph (02) 816 5625. QTHR.

WANTED - NSW

VK2 STATE CO-ORDINATOR: For intruder watch. Duties to receive, collate, edit reports. Send summary to FIWC. Ph: (071) 825272, Bill Horner, VK4MWZ, QTHR, FIWC.

MANUAL (OR PHOTOCOPY) FOR A HEATHKIT 'SCANALYZER': Model SB-620. All costs refunded. Trevor VK2FHF. QTHR.

ZX-SPECTRUM ADDRESSES: For user groups, retail outlets. Hardware and software info required. Will reimburse costs. Stephen VK2BLQ. QTHR. Ph: (02) 4196788.

CIRCUIT AND CONSTRUCTIONS DETAILS MORSE KEYBOARD: With variable speed and buffer will pay costs. VK2ED ED DYRING QTHR. (043) 284106.

HAMADS

CRYSTALS FOR CW SECTIONS OF 20, 40, 80 METRES: Also Coax 50 OHM 80 ft. Leo VK2QB QTHR. (049) 433392, 20 Cathrine Street, Kotara South, NSW, 2289.

WANTED - VIC

FT101Z/ZD OR TS530S: Will consider other HF transceivers with tube finals and in-built 240V AC. Alan VK3AMT Ph: (03) 7899106.

YAESU TRANSCEIVER FTDX401 OR 560: Price according to condition. Ron Cannon VK3BRC QTHR. Ph (03) 8193568 all hours.

KENWOOD TU35B REPEATER TONE UNIT: To suit TR2600A, good condition, working. 10-50W linear RF amp for in car use, to suit above TR2600A. Keith Vriens, VK3AFI, QTHR. (052) 213658 AH.

VINTEN MTR20 MOBILE VHF VALVE UNITS: In good condition. Ph: (059) 861486.

FOR SALE - VIC

FISK-PORT SUPERHET MODEL 62 PRE-WAR AC-DC: Not working. Good order. Old copies WIA magazine. Lot $20, SWL L31160, Lowes 45 2802.

ICOM HAND HELD IC 2A: $200, 25 watt mobile IC 25A $300. QTHR VK3OO George (03) 3374903 licensed amateurs only.

SIEMENS MODEL 100 TELEPRINTER: Good order, all manuals $45, pickup only at QTHR. Andy VK3UJ (03) 7353335.

SHACK CLEAROUT: Assorted transmitter, receiver, power supply parts. Test gear, audio and rf racks, panels, patch bays. AM modulation monitors, 1000 watt broadcast transmitter mostly complete. All offers seriously considered. Chris VK3JU. QTHR (03) 861 7204.

FT 230 R 2MX FM TCVR: 10/25 watts, little use, (second rig) as new, and mint cond. Complete incl manual in orig carton. $480. Licensed amateurs only. (059) 41 1248.

REALISTIC TRC 210 5WATT 40 CHANNEL HANDHELD TRANSCEIVER: Including Nicads $200. GIL VK3CQ (057) 551158 B.H.

SAGEM TELEPRINTER: Including punch and reader $400. Phone (057) 551158. Bus hours. GIL VK3CQ.

FT200 TRANSCEIVER: (Unmodified), power supply, microphone. All in very good condition with new 6JS6 finals and spare 6JS6s and most other valves. $325. DAIWA RF550 speech processor $80. Micronta SWR meter $15. Sell all items $375. Ron VK3QP Ph (03) 5783393.

FREQUENCY METER BC-221-AH: Incl. orig. calibration book recently overhauled with external regulated P. Supp. $25 plus freight can supply info re conversion to FET's. Ken VK3ZFI. QTHR Phone (03) 580 5347.

KENWOOD TS-430S: In good condition. Original packing. With hand microphone, plugs, etc. $1250.00 Bill VK3WK QTHR Ph (055) 671048.

CICADA 300 DATA PHONE MODEM: $150 VGC also Radio Shack DMP 100 Printer plus Instruction Manual VGC $200 ONO. A Pantazis 62 Honey Suckle St Bendigo 3550, Vict.

WANTED - QLD

FT200: In or out of repair. Must have all xtals. Please phone (071) 487409 after 5pm.

FOR SALE - QLD

AEA MICRO PATCH MAP64/2/RTTY/CW: Adaptor for Commodore 64. $325. VK4DN. Phone (07) 3935247.

300VA INVERTER TRANSFORMER FOUR WINDINGS: 9.8VAC, 30 amps peak, plus one tickler winding 12V 0.5A, to 240V. RMS at 300WRMS. Price $45. Phone (071) 487409 after 5pm.

FOR SALE - SA

YAESU FT757GX: $1350, FC757AT automatic ATU - $650, FP700 PSU - $275 all in perfect condition SWL use only accept offer complete station.
BEARCAT 201 SCANNER: $350
DSE COMMANDER: 2 meter complete and working - $165
TR2400: synthesised hand held accessories - $285
OSCILLOSCOPE KIKUSUI 20 MHz COS5020: $650
EMTEK LC DIGITAL METER: $125
HEATHKIT RF OSCILLATOR: $190
RADIO CONTROLLED 4WD HOTSHOT TAMIYA CAR: $275
Lots of other test equipment counters etc. For further details or offers call Martin VK5GN QTHR (08) 2654188

COMMODORE VIC20 COMPUTER: $125.00, CW RTTY (ASCII-BAUDOT) cartridge. $80.00 modem. (H.B.) Micro amptor patch circuit. $150.00 Siemens 100 with puncher and reader. $40.00 All ONO. Clarrie VK5NA QTHR. Phone (085) 656238.

WANTED - WA

SERVICE MANUAL FOR FT101: Will purchase or pay for all photocopy costs and postage. Reply to VK6ZR QTHR. Phone (09) 2761357 AH. Reverse charge.

XTAL FILTER: Approx 50KHZ bandwidth. Prefer centre freq. 10.7MHz Ph Peter VK6AQ (09) 307 4960.

TRANSCEIVER: 6 meters, any type working or not. Wayne VK6AMS (09) 341 3034.

FOR SALE - W A

ANTENNAE ATN 4 ELEMENT MONOBANDER: 20 Metre in excellent condx. Will ship $295. Phone 09 293 2347 anytime QTHR.

QTH WITH APPROVED MASTS, ROTATOR CO-AX CABLES, 4BR 2BTH DB/T MODERN HOME location Mandurah W.A. Details ph 09 535 2490. VK6AMG Dunk QTHR VK6HE

WANTED - TAS

VK7 STATE CO-ORDINATOR: For Intruder Watch. Duties to receive, collate, edit reports. Send summary to FIWC. Ph (071) 825272. Bill Horner, VK4MWZ, QTHR, FIWC.

FOR SALE - NT

4CX250B/7203 EIMAC VALVES: (2) plus SK-600A sockets and 1 x chimney. Brand new. Swap for VHF handheld or mobile rig. Eddie VK8XX (089) 527691 AH. (089) 529366 BH.

Stolen equipment

FT7 transceiver, serial no 8K 110846 stolen from car of VK2IV on 4 Nov 1988 and reported to Pymble police station. Any information to O R Pearce VK2IV, 12 Helen Street, Forster, 2428.

Trio Kenwood TS130S transceiver S/N 1090168

Trio Kenwood MC50 desk microphone S/N N/A

IcomIC-2A hand-held transceiver S/N 12213837

Yaesu FP707 12V 20A power supply S/N 1H120548

Stolen during house-breaking on 22 December 1988 from VK5ABY and reported to Port Adelaide CIB. Any information to BJ Brice VK5ABY, 21 Riverway, Fulham Gardens, 5024 or police (08) 496111.

ADVERTISER'S INDEX

HAMADS

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.

*Eight lines free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclosed a mailing label from this magazine with your Hamad.

*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.

*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.

*QTHR means address is correct as set out in the WIA current Call Book.

*A courtesy note will be forwarded to acknowledge that the ad has been received.

Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.

Conditions for commercial advertising are as follows: $22.50 for four lines, plus $2.00 per line (or part thereof) Minimum charge — $22.50 pre—payable.

State: .....

❑ Miscellaneous
❑ For Sale
❑ Wanted

Name: .....

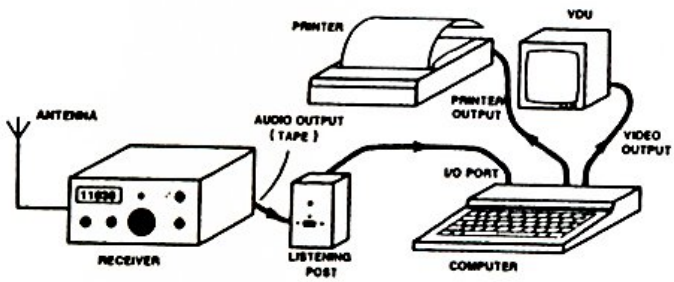
Call Sign: .....

Address: .....

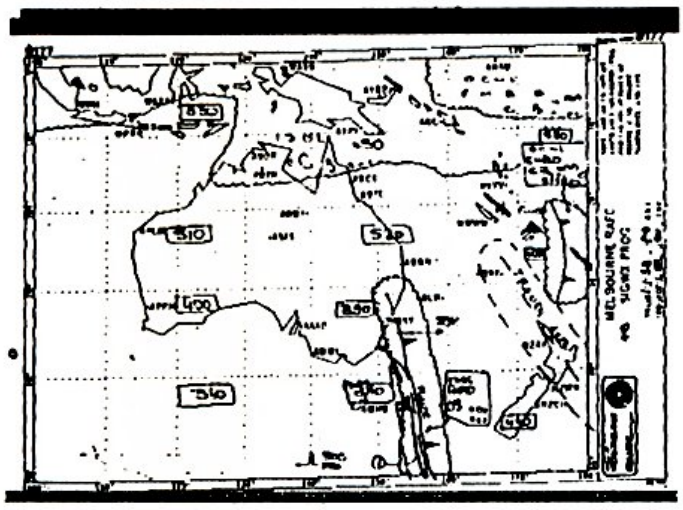
.....

RECEIVE FAX, RTTY & MORSE ON YOUR COMPUTER

Using the Australian Electronics Monthly "Listening Post" (AEM3500) project, you can tune-in to the myriad of non-voice transmissions on shortwave and decode them! All you need is a shortwave receiver with SSB reception, the AEM3500 Listening Post, computer and software. Be the first on your block to receive weather pictures and foreign news bulletins – USEFUL and FASCINATING.



Get the Most Out of Your Receiver!



MONSIEUR LE SECRETAIRE GENERAL, DES VOTRE NOMINATION A LA HAUTE FONCTION QUE VOUS OCCUPEZ VOUS AVEZ MARQUE AVEC FORCE L'IMPORTANCE QUE VOUS ATTACHIEZ A CE QUE L'ORGANISATION RETROUVE LES PRINCIPES QUI L'AVAIENT FONDEE : ''NOUS NOUS SOMMES, DISIEZ-VOUS, SANS CONTESTE, BEAUCOUP ECARTES DE LA CHARTE CES DERNIERES ANNEES. NOUS SOMMES PERILLEUSEMENT PROCHES D'UN NOUVEL ETAT D'ANARCHIE INTERNATIONALE''. ET UN PEU PLUS LOIN VO

Available in two packages:

- **SOFTWARE ONLY**
  Apple, Commodore 64, Microbee – **$25.00**

- **FULL PACKAGE – software & pc board.**
  Apple, Commodore 64, Microbee – **$35.00**

Both packages include full instructions for building the Listening Post project and application notes for your computer.

Send to: "AEM Listening Post Software", 1st Floor, 347 Darling St, BALMAIN 2041 NSW.

*You must include a blank C10 cassette or **formatted** disk.*
Please Tick.

☐ *Software Only*
☐ *Full Package*

☐ Microbee – Epson FX80/100 printer
☐ Microbee – C.Itoh 8510 printer
Microbee: ☐ 5¼" and ☐ 3½" disk

☐ Commodore C64/128 (most printers)
Commodore: ☐ 5¼" disk or ☐ cassette

☐ Apple (most printers)
☐ 5¼" disk ONLY

☐ Cheque ☐ Money Order
☐ B/Card ☐ M/Card ☐ Visa
(make cheques or money orders payable to "Australian Electronics Monthly")

Card No ..... Expiry .....
Signed .....
Name .....
Address .....
.....
..... P/Code .....

Regd Address:
1st Floor, 347 Darling Street, Balmain, NSW 2041

THE NEW ICOM IC32AT, OVER. WITH ITS DUPLEX FACILITY, OVER. MEANS YOU WON'T HAVE TO TALK LIKE THIS, OVER AND OUT.

The IC32AT is the newest dual band handheld transceiver by Icom.

It has been designed with the most advanced VHF technology the electronics industry can offer.

And this little 2 metres and 70cm compact handheld offers full duplex facility.

Which means instead of a broken conversation, you can now simultaneously transmit on one band and receive on the other. Just like a telephone conversation.

No longer do you have to wait for a long "Over". It's full "Break in".

And with its high output power, you can be sure your words are heard. The IC32AT uses a custom designed power module as the final amplifier. Which means this transceiver puts out 5.5W on 2 metres and 5W on 70cm.

So you will never be at a loss to make that repeater.

What's even more incredible, each of the twenty memory channels can store two frequencies: operating frequency and offset frequency are just a couple of examples.

The Programmed Scan function scans all the frequencies between two programmable scan edge frequencies, while the Memory Scan function scans all memory channels in succession, except, of course, those you lock out. In short, you can scan 2 metres, 70cm or all channels.

Thanks to the handy little pocket beep, you'll never miss a call. By installing the UT-40 Tone Squelch Unit (sold separately) the transceiver functions as a pager.

You can use the built-in DTMF keyboard to access a repeater and to make a phone patch. The key numbers and letters are printed large for quick and easy reading.

As for monitoring the input frequency when you work a repeater, that's as simple as pushing the Monitor switch on the side panel to open the squelch and check the frequency.

Every five seconds, Priority Watch monitors the Call Channel, or one or all the memory channels in succession.

And that's while you operate!

When you want to change the frequency or the memory channel fast, the Dial Select changes the 1MHz, 100kHz digit or the memory channel directly. One push of the button does it.

All these functions not only make the Icom IC32AT the most advanced dual band handheld transceiver available, but also very easy to use.

Call (008) 338 915 for your nearest Icom stockist today.

The telephone conversation in itself will be a very good demonstration of the IC32AT's duplex facility.

Over and out.

ICOM

The Ball Partnership ICO 0024